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Resource Management Plan and Environmental Impact Statement for the Kemmerer Field Office Planning Area

Volume 2 of 2
Appendices, Glossary, and Maps

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

July 2007

BLM

Wyoming State Office - Kemmerer Field Office

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Resource Management Plan and Environmental Impact Statement for the Kemmerer Field Office Planning Area

Volume 2 of 2
Appendices, Glossary, and Maps

U.S. Department of the Interior
Bureau of Land Management
Kemmerer Field Office, Wyoming

July 2007

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KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX A

Conservation Measures, Conservation Agreements, and BLM-Endorsed Management Strategies for Special Status Species

Appendix A
Conservation Measures, Conservation Agreements, and BLM-Endorsed Management Strategies for Special Status Species

Management of special status species on public lands administered by the Bureau of Land Management (BLM) is directed by a variety of laws, policies, and other requirements. Special status species are those listed as threatened or endangered, are proposed for listing, or are candidates for listing under the provisions of the Endangered Species Act (ESA); those listed by a state implying potential endangerment or extinction (i.e., Native Species Status); or those designated by the BLM State Director as sensitive. Species in Wyoming are considered to be of special concern if (1) the species is vulnerable to extinction at the global or state level due to inherent rarity, (2) the species has experienced a significant loss of habitat, or (3) the species is sensitive to human-caused mortality or habitat disturbances.

The intent of the sensitive species designation is to ensure actions on the BLM-administered lands consider the welfare of these species and do not contribute to the need to list other Special Status Species under the provisions of the ESA.

The BLM Wyoming State Office conducts an annual review of its sensitive species list to make additions or deletions based on the most current information on species status. At the time of this writing, the planning area has 1 threatened plant species, 8 sensitive plant species, 4 endangered and 7 sensitive fish species, 3 wildlife species either threatened or endangered, 1 experimental/non-essential wildlife species, 1 candidate wildlife species, and 22 sensitive wildlife species that may be impacted in the planning area. Conservation measures, conservation agreements, and BLM-endorsed management strategies for federally threatened and endangered species are identified below.

CONSERVATION MEASURES

Plants

Ute Ladies'-tresses (Threatened)

The following section presents new conservation measures reviewed by all 10 Wyoming BLM field offices and agreed upon by all 10 field managers. These measures will be implemented upon acceptance of the statewide biological assessment (BA) (BLM 2005a) by the U.S Fish and Wildlife Service (USFWS). These measures are provided to outline opportunities to benefit populations of the orchid, and to help reduce or eliminate adverse effects from the spectrum of management activities on BLM land. These measures also outline opportunities to benefit the orchid, and to help avoid negative impacts through the thoughtful planning of activities. Implementation of these measures is expected to lead to conservation of the species.

These conservation measures are binding measures that the BLM will implement to facilitate conservation of the orchid. However, because it is impossible to provide measures that will address all possible actions in all locations across the range of the orchid, it is imperative that project-specific analysis and design be completed for all actions that could affect the orchid. Circumstances unique to individual projects or actions and their locations may still result in adverse effects to this plant. In these cases, additional or modified conservation measures may be necessary to avoid or minimize adverse effects; further consultation with the USFWS will be required. The order in which the conservation measures appear below does not imply their relative priorities.

1. Grazing will be managed intensively within known habitats containing populations from July through September to allow plants to bloom and seed.
2. Recreational site development will not be authorized in known Ute ladies'-tresses habitats.
3. The BLM will manage stream habitats with known populations of Ute ladies'-tresses to retain, re-create, or mimic natural hydrology, water quality, and related vegetation dynamics. Projects that may alter natural hydrology or water quality, change the vegetation of the riparian ecosystem and (or) cause direct ground disturbance will be evaluated and redesigned to ensure that adverse effects to populations of Ute ladies'-tresses do not occur.
4. The BLM will add the following two conservation measures to grazing permit renewals in allotments with known populations of Ute ladies'-tresses.
    a. The BLM will ensure the placement of mineral supplements or new water sources (permanent or temporary) for livestock, wild horses, or wildlife at least 1 mile from known Ute ladies'-tresses populations. Supplemental feed for livestock, wildlife, or wild horses will not be authorized within 1 mile of known Ute ladies'-tresses populations. Straw or other feed must be certified weed-free. These restrictions are intended to keep free-ranging livestock away from Ute ladies'-tresses populations and potential overgrazing of the areas occupied by these orchids. Surveys for Ute ladies'-tresses will be conducted in potential Ute ladies'-tresses habitats prior to livestock operations-related construction projects.
    b. The BLM will not increase permitted livestock stocking levels in any allotment with pastures containing known Ute ladies'-tresses populations without consulting with the USFWS.
5. Biological control of noxious plant species will be prohibited within 1 mile from known Ute ladies'-tresses orchid habitats until the impact of the control agent has been fully evaluated and determined not to adversely affecting the plant population. The BLM will monitor biological control vectors.
6. Except in cases of extreme ecological health (insect or weed outbreaks/infestations), herbicide treatment of noxious plants/weeds will be well-regulated within 0.25 miles of known populations of the orchid and insecticide/pesticide treatments will be well-regulated within 1 mile of known populations of Ute ladies'-tresses orchids to protect pollinators.

    Where insect or weed outbreaks have the potential to degrade area ecological health inside the buffers listed above, at the discretion of the BLM's authorized officer and with concurrence by the USFWS, the following will apply: where needed and only on a case-by-case basis, a pesticide-use proposal or other site-specific plan will address concerns of proper timing, methods of use, and chemicals. Pesticides specific to dicots will be preferred when these are adequate to control the noxious weeds present.

    Aerial application of herbicides will be planned carefully to prevent drift in areas near known populations of Ute ladies'-tresses orchids (outside of the 0.25-mile buffer). The BLM will work with the Animal and Plant Health Inspection Service (APHIS), the USFWS, and county weed and pest agencies to select pesticides and methods of application that will most effectively manage the infestation while least likely affecting Ute ladies'-tresses orchids.
7. If revegetation projects are conducted within 0.25 miles of known habitats for Ute ladies'-tresses orchids, only native species will be selected. This conservation measure will reduce the possibility that nonnative species will be introduced and compete for habitats with Ute ladies'-tresses orchids.

8. The BLM will limit the use of off-road vehicles (OHVs) to designated roads and trails within 0.5 miles of known Ute ladies'-tresses populations, with no exceptions for the "performance of necessary tasks" other than fire fighting and hazardous material cleanup allowed using vehicles off of highways. No OHV competitive events will be allowed within 1 mile of known Ute ladies'-tresses populations. Roads that could impact Ute ladies'-tresses orchids and are not required for routine operations or maintenance of developed projects or lead to abandoned projects will be reclaimed as directed by the BLM.
9. The BLM will apply a condition of approval (COA) on all applications for a permit to drill (APD) oil and gas wells for sites within 0.25 miles of any known populations of Ute ladies'-tresses orchids. This condition will prohibit all authorized surface disturbance and OHV travel from sites containing populations of Ute ladies'-tresses orchids. Operations outside of the 0.25-mile buffer of orchid populations, such as "directional drilling" to reach oil or gas resources underneath the orchid's habitats, would be acceptable.
10. For known Ute ladies'-tresses populations, the BLM will place a controlled surface use stipulation prohibiting all surface disturbances on new oil and gas leases, buffering the area within 0.25 miles of known Ute ladies'-tresses populations. For existing oil and gas leases with known Ute ladies'-tresses populations (these would be for newly discovered populations, not currently documented), the BLM will require the COA in conservation measure 13 below, including the same 0.25-mile buffer area around those known Ute ladies'-tresses orchid populations.
11. The disposal (sale and removal) of salable minerals is a discretionary BLM action and is prohibited within a 0.25-mile buffer area of known populations of Ute ladies'-tresses orchids. To prevent loss of habitats for the orchid, the BLM "shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival" (BLM 2001). Prior to any land-tenure adjustments in known habitats for Ute ladies'-tresses orchids, the BLM will survey to assess the habitat boundary and retain that area in federal ownership. BLM-administered lands that contain identified habitats for the orchid will not be exchanged or sold, unless it benefits the species.
12. All proposed rights-of-way (ROW) projects (powerlines, pipelines, roads, etc.) will be designed and locations selected to be at least 0.25 miles from any known Ute ladies'-tresses orchid habitats to minimize disturbances. If avoidance of adverse effects is not possible, the BLM will reinitiate consultation with the USFWS.
13. All proposed projects will be designed and locations selected to minimize disturbances to known Ute ladies'-tresses orchid populations. If the avoidance of adverse effects is not possible, the BLM will reinitiate consultation with the USFWS. Projects will not be authorized closer than 0.25 miles from any known Ute ladies'-tresses populations without concurrence of the USFWS and the BLM authorized officer. No ground-disturbing construction activities will be authorized within 0.25 miles of any known Ute ladies'-tresses orchid populations during the essential growing season time period (from July through September-the growing, flowering and fruiting stages) to reduce impacts to the species.
14. To conserve and protect natural areas, planned recreational foot trails are created to control human traffic. The BLM will create programs that will strive to protect Ute ladies'-tresses orchid habitats and prevent new trails from being constructed within 0.25 miles from known occurrences of the orchid.

Fish

Colorado River Fishes (Endangered)

The following conservation measures are taken directly from the USFWS memorandum "Biological Opinion, Amoco Moxa Arch Project, Lincoln, Sweetwater and Uinta Counties, WY" (USFWS 1991).

Endangered fish species in the planning area include the Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila Cypha*), razorback sucker (*Xyrauchen texanus*), and bonytail (*Gila elegans*). Conservation measures are set forth by the "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin" (Recovery Program), as signed on January 21 and 22, 1988, by the Secretary of the Interior; the governors of Wyoming, Colorado, and Utah; and the Administrator of the Western Area Power Administration. An objective of the Recovery Program was to identify reasonable and prudent alternatives that would ensure the survival and recovery of the listed species, while providing for new water development in the Upper Colorado River Basin.

The following excerpts are pertinent to the consultation because they summarize portions of the Recovery Program that address depletion impacts, section 7 consultation, and project proponent responsibilities:

> "All future Section 7 consultations completed after approval and implementation of this program (establishment of the Implementation Committee, provision of congressional funding, and initiation of the elements) will result in a one-time contribution to be paid to the USFWS by water project proponents in the amount of $10 per acre-foot based on the average annual depletion of the project .... This figure will be adjusted annually for inflation…. Concurrently with the completion of the Federal action which initiated the consultation…issuance of a 404 permit, 10 percent of the total contribution will be provided. The balance...will be... due at the time the construction commences... Funds from these contributions will be applied equally to flow acquisition and to other recovery activities…" (USFWS 1991).

It is important to note that these provisions of the Recovery Program were based on appropriate legal protection of the instream flow needs of the endangered Colorado River fishes. The Recovery Program further states:

> "...it is necessary to protect and manage sufficient habitat to support self-sustaining populations of these species. One way to accomplish this is to provide long term protection of the habitat by acquiring or appropriating water rights to ensure instream flows…. Since this program sets in place a mechanism and a commitment to assure that the instream flows are protected under State law, the USFWS will consider these elements under Section 7 consultation as offsetting project depletion impacts."

Thus, the USFWS has determined that project depletion impacts, which the USFWS has consistently maintained, are likely to jeopardize the listed fishes, can be offset by (a) the water project proponents one-time contribution to the Recovery Program in the amount of $10.91 per acre-foot of the project's average annual depletion, and (b) appropriate legal protection of instream flows pursuant to state law. The USFWS believes it is essential that protection of instream flows proceed expeditiously, before significant water depletions occur.

With respect to (a) above (i.e., the depletion charge), the applicant will make a one-time payment that has been calculated by multiplying the project's annual average depletion (82 acre-feet) by the depletion charge in effect at the time payment is made. For fiscal year 1991 (October 1, 1990, to September 30, 1991), the depletion charge is $10.91 per acre-foot of the depletion, which equals a payment of $894.62

for this project. This amount will be adjusted annually for inflation on October 1 of each year based on the previous year's Composite Consumer Price Index. The USFWS will notify the applicant of any change in the depletion charge by September 1 of each year. Ten percent of the total contribution or total payment will be provided to the USFWS or its designated agent at the time of issuance of the federal approvals from the BLM. The balance will be due at the time construction commences. Fifty percent of the funds will be used for acquisition of water rights to meet the instream flow needs of the endangered fishes (unless otherwise recommended by the Implementation Committee); the balance will be used to support other recovery activities for the Colorado River endangered fishes. Payment should be made to the National Fish and Wildlife Foundation. If depletion is less than 100 acre-feet, payment is waived (Oles 2007).

Wildlife

Within the Kemmerer planning area, five wildlife species (bald eagle, black-footed ferret, grizzly bear, Canada lynx, and gray wolf) are listed as threatened or endangered, and one is listed as a candidate, the yellow-billed cuckoo. Twenty-one species are listed as sensitive in the Kemmerer planning area (BLM 2002). The conservation measures for the bald eagle, black-footed ferret, grizzly bear, Canada lynx, gray wolf, and yellow-billed cuckoo are identified below. These conservation measures are identified in each species' respective statewide biological assessment (BA).

Bald Eagle (Threatened)

The following recommended conservation measures may further reduce potential adverse effects to bald eagle behavior and their habitats. The measures were prepared in coordination with the USFWS and are identified in the statewide programmatic Bald Eagle (*Haliaeetus leucocephalus*) BA (BLM 2003a).

1. When project proposals are received, the BLM should initiate coordination with the USFWS at the earliest possible date so that USFWS can advise on project design. This should minimize the need to redesign projects at a later date to include bald eagle conservation measures, determined as appropriate by the USFWS.
2. Appropriately timed surveys in bald eagle habitats should be conducted prior to any activities and subsequent authorization that may disturb bald eagles or their habitats. A qualified biologist (not limited by job title) would be approved by the BLM to conduct such bald eagle surveys. All nest surveys should be conducted using procedures that minimize the potential for adverse effects to nesting raptors.

   In the event species occurrence is verified, the proponent may be required to modify operational plans, at the discretion of the authorized officer, to include the appropriate measures for minimization of effects to the bald eagle and its habitats.
3. Appropriate survey methodologies are listed in Appendix C of the statewide programmatic Bald Eagle (*Haliaeetus leucocephalus*) biological assessment (BLM 2003a).
4. Each year the BLM should verify the status of known bald eagle nests, communal winter roosts, and concentration areas on lands administered by the BLM. As a matter of maintaining inventory information, the BLM should coordinate annually with USFWS, the Wyoming Game and Fish Department (WGFD), and other appropriate entities to determine the status of known and new bald eagle nests, communal winter roosts, and other concentration areas. Known bald eagle nests, communal winter roosts, and concentration areas will be assumed active if status has not been verified.
5. Activities and habitat alterations that may disturb bald eagles will be restricted within suitable habitats that occur within bald eagle buffer zones (see statewide BA for further description).

Zone 1 (within ½ mile 1 February to 15 August) is intended to protect active and alternative nests. For active nests, minimal human activity levels are allowed during the period of first occupancy to 2 weeks after fledging.

Zone 2 (within ½ -1 mile from the nest) is intended to protect bald eagle primary use areas and permits light human-activity levels.

Zone 3 is designated to protect foraging/concentration areas year-round. Zone 3 would include one of two larger areas, depending on the following habitat types: (a) 2.5 miles extending in all directions from the nest or (b) ½ mile from the stream bank of all streams within 2.5 miles of the nest. Site-specific habitat types and foraging areas will be evaluated to determine which Zone 3 buffer applies. Zone delineation depends on habitat types. Exceptions may be made after consultation with the USFWS.

6. Activities that may disturb bald eagles will be restricted within 1 mile of known communal winter roosts during the period of November 1 through April 1. No ground-disturbing activities will be permitted within 1 mile of active roost sites year round.
7. BLM-administered lands within 1 mile of an integral part of bald eagle habitats including nests, communal winter roosts, and foraging/concentration areas should not be exchanged or sold.
8. Powerlines should be built to standards identified by the Avian Power Line Interaction Committee.
9. Proponents of BLM-authorized actions should be advised that roadside carrion can attract foraging bald eagles and potentially increase the risk of vehicle collisions with bald eagles feeding on the carrion. When large carrion occurs on the road, appropriate officials should be notified for necessary removal.
10. BLM should coordinate with the APHIS -Wildlife Services Division to minimize potential impacts to the bald eagle and its habitats from pest/predator control programs that may be included in the local animal damage control plan. The USFWS also should be included in this coordination.
11. Proposed and future water projects should not be designed to discharge into drainages or reservoirs occurring within 500 feet of county roads and highways. This measure is intended to minimize vehicle collisions with wildlife, using the water source and subsequent eagle-vehicle collisions.
12. The BLM should provide educational information to project proponents and the public pertaining to the following topics: appropriate vehicle speeds and the associated benefit of reduced vehicle collisions with wildlife, use of lead shot (particularly over water bodies), use of lead fishing weights, and general ecological awareness of habitat disturbance.
13. In the event a dead or injured bald eagle is found, the USFWS Wyoming Field Office (307-772-2374) and the USFWS Law Enforcement Office (307-261-6365) should be notified within 24 hours of the discovery.
14. The BLM should coordinate with other agencies and private landowners to identify voluntary opportunities to modify current land stewardship practices that may impact the bald eagle and its habitats.
15. The BLM should monitor and restrict, when and where necessary, authorized or casual-use activities that may impact bald eagles or their habitats, including, but not limited to, recreational mining and oil and gas activities.

16. The BLM should periodically review existing water quality records (e.g., Wyoming Department of Environmental Quality [DEQ], WGFD, U.S. Geological Survey [USGS], etc.) from monitoring stations on, or near, important bald eagle habitats (i.e., nests, roosts, concentration areas) on public land for any conditions that could adversely affect the species. If water quality problems are identified, the BLM should contact the appropriate jurisdictional entity to cooperatively monitor the condition and (or) take corrective action.
17. Projects that could disturb bald eagles should be completed in the least amount of time and during periods least likely to affect the bald eagle.
18. Projects that could disturb bald eagles or their habitats should be monitored and the monitoring results should be considered in the design and implementation of future projects.

Black-footed Ferret (Endangered)

The following conservation measures are taken directly from the *Final Statewide Programmatic Biological Assessment: Black-footed Ferret* (*Mustela nigripes*) (BLM 2005b).These conservation measures aim to reduce potential effects to black-footed ferrets and their habitats and highlight the steps the BLM can take to work toward recovery of the species.

The conservation measures listed below are separated into Species Conservation Measures, which affect the species directly; Habitat and Mapping Measures, which protect habitat and address prairie dog colonies and mapping activities; and Recovery/Reintroduction Measures, which address the BLM's role in and commitment to recovery of the species.

Species Conservation Measures

1. When project proposals are received for areas that still require black-footed ferret surveys and meet potential habitat criteria as defined by the USFWS guidelines, the BLM shall initiate coordination with the USFWS at the earliest possible date so that the USFWS can provide input. This should minimize the need to redesign projects at a later date to include black-footed ferret conservation measures, determined as appropriate by the USFWS.
2. In areas identified in conservation measure number one above (non-block cleared areas), if suitable prairie dog town/complex avoidance is not possible, surveys of towns/complexes for black-footed ferrets shall be conducted according to USFWS guidelines and recommendations. This information shall be provided to the BLM and the USFWS in accordance with Section 7 of the Endangered Species Act, and the Interagency Cooperation Regulations.
3. Observations of black-footed ferrets, their sign, or carcasses on a project area and the location of the suspected observation, however obtained, shall be reported within 24 hours to the appropriate local BLM wildlife biologist and Field Supervisor of the USFWS office in Cheyenne, Wyoming, at (307) 772-2374. Observations should include a description including what was seen, time, date, exact location, suspected cause of death, and the observer's name and telephone number. Carcasses or other "suspected" ferret remains shall be collected by the BLM or USFWS employees and deposited with the USFWS Wyoming Field Office or USFWS law enforcement office. While BLM employees would not likely have a permit to "collect" a black-footed ferret carcass, it is imperative that a carcass be salvaged and immediately transported to the USFWS so that the carcass is not scavenged and as much pertinent information concerning the cause of death be gathered, including photographs, so that an accurate depiction of the fatality can be documented.

4. If black-footed ferrets or their signs are found on public lands outside of the Shirley Basin non-essential experimental population boundary (even within a prairie dog town or complex previously determined to be unsuitable for, or free, of ferrets), all previously authorized project-related activities (or actions on any future application that may directly, indirectly, or cumulatively affect the colony/complex) ongoing in such towns or complexes shall be suspended immediately and Section 7 consultation reinitiated with the USFWS. An emergency road closure for other than official travel (official travel would be defined as only those activities that are necessary to evaluate the black-footed ferret find) will be enacted by the BLM within 48 hours of the find to protect newly discovered black-footed ferrets. This emergency road closure would be for all nonpaved roads within at least 1 mile of the find. A task force including at least one member of the BLM, USFWS, WGFD and USGS-BRD will be formed within 48 hours of the find to assess the needs of protecting the newly discovered black-footed ferrets. The BLM shall coordinate with these three agencies to ensure that ferret surveys or other appropriate actions are conducted at such locations.
5. Information shall be provided and posted in common areas and circulated in a memorandum among all employees and service providers. This information shall illustrate the black-footed ferret and its signs; describe morphology, tracks, scat, skull, habitat characteristics, behavior, and current status; and explain the relationship between project development and impacts to black-footed ferrets, especially regarding canine distemper.

Habitat and Mapping Measures

1. All white-tailed prairie dog towns/complexes greater than 200 acres in size and black-tailed prairie dog towns/complexes greater than 80 acres shall be assessed and mapped for any projects that are proposed within such areas. Associated burrow densities on potentially affected towns shall be determined, when necessary, pursuant to USFWS- and BLM-approved techniques to determine whether the criteria established for ferret occupancy in the USFWS (1989) guidelines for black-footed ferrets are met.
2. New prairie dog towns can be established on public lands in all circumstances where they would not interfere with other previously established activities.

Recovery/Reintroduction Measures

The BLM shall work with the USFWS and the WGFD to establish Management Areas (MAs) for potential reintroduction sites for black-footed ferrets. These areas will be selected based on a number of factors, including BLM's ability to protect and manage them, their size (optimally 5,000 to 10,000 acre sites), and potential utility to black-footed ferrets. Because of the need to manage reintroduction sites (of prairie dog complexes) on a landscape scale, and because plague is a significant but unpredictable event, MAs may be selected that are currently "plagued out," but may recover in time. Complexes can be selected from, but not necessarily restricted to, those shown in Map 3. Protective measures shall be drawn up for these MAs, and may include being withdrawn from leasing and protected from commercial development (i.e., land disposal through Recreation and Public Purpose Act actions, etc.). Examples of protective measures that will be included in these MAs are:

- Work with the WGFD and other state agencies, as appropriate and respective USFWS offices to ensure that enough reintroduction sites are maintained to successfully recover the black-footed ferret. If areas available for reintroduction are removed through BLM's authorized actions below a threshold level so the black-footed ferret can no longer be recovered, then those actions reducing availability of reintroduction sites will be modified or discontinued until the black-footed ferret has been recovered.

- The BLM shall monitor and post restrictions, if necessary, on recreational opportunities and other uses on BLM-administered lands within 1 mile of formally proposed and active reintroduction sites for black-footed ferrets.
- The BLM and operators shall conduct educational outreach to employees regarding the nature, hosts, and symptoms of canine distemper and its effects on black-footed ferrets, focusing attention on why employees should not have pets on worksites during or after hours. The BLM shall encourage operators to develop policies to prohibit dogs from operation sites or require current distemper vaccinations within black-footed ferret reintroduction areas. It is recommended that vaccinated puppies not be allowed into the black-footed ferret reintroduction areas until 1 month after their final distemper vaccination due to potential effects of the modified live virus vaccine.

Grizzly Bear (BLM Sensitive)

The grizzly bear was delisted from threatened status on March 29, 2007 (USDI 2007), but remains a BLM sensitive species. The following conservation measures are taken directly from the *Final Statewide Programmatic Biological Assessment: Grizzly Bear (Ursus arctos)* (BLM 2005c). These BLM-committed conservation measures are to be implemented in grizzly bear habitats, and are intended to minimize or eliminate adverse impacts likely to result from implementation of the management actions provided in the Resource Management Plans (RMPs). The BLM is committed to the implementation of these 12 conservation measures. In the future, it is expected that grizzly bears will reoccupy historic ranges and move into new areas. The BLM will ensure the implementation of these conservation strategies for the protection and management of newly established populations.

The most important factors affecting grizzly bears on the landscape are the levels of human activities including food storage, livestock allotments, motorized access, and site development. One of the key habitat factors in the maintenance of grizzly bear populations is the protection of secure habitats, defined as all areas more than 500 meters from an open or gated motorized access route or high use non-motorized trail larger than 10 acres and providing all the key elements needed for the survival and life functions of these animals (such as food sources, cover, denning areas, and security from human disturbance and disruptive activities). Human behavior and habitat are both addressed in the following conservation measures.

1. The BLM shall ensure that authorized activities planned to occur in currently occupied grizzly bear habitat shall be analyzed and planned with active grizzly bear protection measures. Restrictions on timing of activity and spatial considerations for grizzly bears, or other parameters, will be implemented to avoid or prevent significant disruptions of normal or expected bear behavior and activity in the area.
2. The BLM shall provide a packet of educational materials to authorized permittees in grizzly habitats, including, but not limited to, special recreation permittees, livestock permittees/lessees, and timber operators.
3. In occupied grizzly bear habitats and in areas of bear conflicts, the BLM shall install bear-resistant refuse containers in developed campgrounds and picnic areas where refuse containers are provided and maintained. In areas receiving dispersed recreational use, the BLM shall inform the public of proper storage techniques for food and refuse.
4. The BLM shall ensure that operation plans and special use permits in occupied grizzly bear habitats will specify food storage and handling and garbage disposal standards. All temporary living facilities under temporary use permits in occupied grizzly bear habitats will be required to practice proper food storage and keep all potential attractants stored so they are unavailable to

bears. Edibles and (or) garbage will be secured from access by grizzly bears. Bear-proof refuse containers and timely refuse collection to prevent container overflow shall be required.

5. Important grizzly bear food resources that may occur on BLM land, particularly whitebark pine, army cutworm moths, ungulates (primarily elk calving grounds), and spawning cutthroat trout shall be noted and monitored. Other important foods may be added to those listed above as the understanding of grizzly bear food resources on BLM land grows. Monitoring protocols for these food resources can be adapted from the statewide BA, Appendix E of the Conservation Strategy (http://www.fs.fed.us/r1/wildlife/igbc/ConservationStrategy/CSappendices.pdf).
6. The BLM shall continue to attend, and be a member of, the Yellowstone Ecosystem Subcommittee of the Interagency Grizzly Bear Committee. After delisting, the BLM shall continue to participate in the appropriate coordination group(s).
7. The BLM shall not approve commercial cutting or other removal of whitebark pine in the six field offices analyzed in this document in occupied or potential grizzly bear habitats.
8. The BLM shall implement strategies to reduce human-bear and domestic livestock-bear conflicts by conducting an evaluation of the causes of such conflicts when they do occur and determining what can be done to avoid or reduce such conflicts in the future. Currently, these conflicts are discussed at the Northwest Wyoming Level One Streamlining Team meetings held approximately every 45 to 60 days.
9. All permit holders conducting activities on public lands in occupied grizzly bear habitats that could result in livestock carcasses being left in locations where bears might be attracted to them shall be informed that all livestock carcasses or parts of carcasses must either be packed, dragged, or otherwise transported to a location a minimum of ½ mile from any inhabited dwelling, sleeping area, tent, road, trail, or recreation site in as timely a manner as possible, unless otherwise directed by a BLM range/wildlife specialist or ranger. Carcasses must be moved at least 100 yards from live water. Other options for carcass disposal may include using explosives or burning the carcass at the discretion of a BLM range/wildlife specialist or ranger. In cases of uncertainty on carcass disposition the permit holder (or lessee) shall contact the appropriate BLM field office.
10. The BLM shall require that the proper functioning condition of existing aquatic systems and riparian zones in occupied grizzly bear habitats will be maintained for all BLM-administered public lands. If these areas are polluted and (or) damaged from activities, lessee/permittee/grantee or BLM will be required to assume full responsibility for rehabilitation and restoration of such areas.
11. The BLM shall require that existing roads, drilling pads, and other areas with vegetation removed due to authorized activities in occupied grizzly bear habitats will be revegetated and reclaimed by lessee/permittee/grantee in a fashion that considers all grizzly bear needs or requirements.
12. Wild horse roundups and other intensive wild horse management activities shall avoid areas in or immediately adjacent to occupied grizzly bear habitats.

Canada Lynx (Threatened)

The following conservation measures are taken directly from the *Final Statewide Programmatic Biological Assessment: Canada Lynx* (*Lynx canadensis*) (BLM 2005d). These conservation measures are intended to conserve the lynx and to reduce or eliminate adverse effects from the spectrum of management activities on BLM land. These measures are provided to outline opportunities to benefit the lynx and to help avoid negative impacts through thoughtful planning of activities.

These conservation measures are binding measures that the BLM shall implement to facilitate conservation of lynx. Lynx analysis units (LAUs) typically encompass lynx habitats (may or may not be currently in suitable condition for denning or foraging habitat) and other areas (such as lakes, low elevation ponderosa pine forest, and alpine tundra). The conservation measures listed below generally apply only to lynx habitats within the LAUs; however, their use in areas of lynx habitats or potential lynx habitats not fitting the criteria of an LAU is encouraged.

Because it is impossible to provide measures that will address all possible actions in all locations across the broad range of the lynx, it is imperative that project-specific analysis and design be completed for all actions that could affect lynx. Circumstances unique to individual projects or actions and their locations may still result in adverse effects on lynx. In these cases, additional or modified conservation measures may be necessary to avoid or minimize adverse effects.

All Programs

1. Within an LAU, the BLM shall ensure that mapping occurs of lynx habitats and nonhabitats, as well as their denning habitats, foraging habitats, and topographic features important for lynx movement. The BLM or project proponent shall identify whether all lynx habitats within an LAU are in suitable or unsuitable conditions. This will involve interagency coordination when LAUs cross administrative boundaries.
2. The BLM shall limit disturbance within each LAU to 30 percent of the suitable habitats within the LAU. If 30 percent of the habitats within an LAU are currently in unsuitable conditions, no further reduction of suitable conditions shall occur as a result of management activities. The BLM shall map oil and gas production and transmission facilities, mining activities and facilities, dams, forest management, and agricultural lands on public lands and evaluate projects on adjacent private lands to assess cumulative effects. This will involve interagency coordination when LAUs cross administrative boundaries, primarily with the U.S. Forest Service (USFS).
3. BLM management actions shall not change more than 15 percent of lynx habitats within an LAU to an unsuitable condition within a 10-year period. This will involve interagency coordination where LAUs cross administrative boundaries.
4. The BLM shall maintain denning habitats in patches generally larger than 5 acres, comprising at least 10 percent of lynx habitats. When less than 10 percent is currently present within an LAU, management actions that would delay development of denning habitat structures shall be deferred. This will involve interagency coordination when LAUs cross administrative boundaries.
5. The BLM, using best available science, shall ensure that key linkage areas that may be important in providing landscape connectivity within and between geographic areas across all ownerships are identified.
6. The BLM shall ensure that habitat connectivity within and between LAUs is maintained.
7. The BLM shall document lynx observations (tracks, sightings, as well as date, location, and habitat) and provide these to the Wyoming Natural Diversity Database (WYNDD). The BLM also shall request an annual update from the WYNDD on all sightings for review in each field office.

Forest Management

1. Following a disturbance (blowdown, fire, insects) that could impact lynx denning habitats, the BLM shall allow no salvage harvest when the affected area is smaller than 5 acres. Some exceptions apply, as specified in the LCAS timber management project planning standards.
2. The BLM shall allow precommercial thinning only when stands no longer provide snowshoe hare habitats.

3. In aspen stands, the BLM shall ensure the application of harvest prescriptions that favor regeneration of aspen.
4. The BLM shall ensure that improvement harvests (commercial thinning, selection, etc.) are designed to retain and improve recruitment of an understory of small diameter conifers and shrubs preferred by hares.

Fire Management

1. In the event of a large wildfire, the BLM shall ensure that a post-disturbance assessment prior to salvage harvest be conducted, particularly for stands that were formerly in late successional stages, to evaluate the potential for lynx denning and foraging habitats.
2. The BLM shall ensure that construction of temporary roads and fire lines are minimized to the extent possible during fire-suppression activities, and shall ensure revegetation of roads and firelines that are necessary. Construction on ridges and saddles should be avoided, if possible.

Recreation

1. The BLM shall allow no net increase in groomed or designated over-snow routes and snowmobile play areas in LAUs unless the designation serves to consolidate unregulated use and improves lynx habitats through a net reduction of compacted snow areas. This is intended to apply to dispersed recreation rather than existing ski areas. Winter logging activity is not subject to this restriction.
2. In lynx habitats within an LAU, the BLM shall ensure that federal actions do not degrade or compromise landscape connectivity or linkage areas when planning and operating new or expanded recreation developments.
3. The BLM shall ensure that trails, roads, and lift termini are designed to direct winter activities away from diurnal security habitats.
4. To protect the integrity of lynx habitats, the BLM shall ensure that (as new information becomes available) winter recreational special use permits (outside of permitted ski areas) that promote snow-compacting activities in lynx habitats are evaluated and amended, as needed.

Livestock Grazing

1. The BLM shall ensure that livestock use in openings created by fire or forest management that would delay successful regeneration of the shrub and tree components is not allowed. This regeneration may take 3 years or longer and will depend on site-specific conditions.
2. The BLM shall ensure that grazing in aspen stands is managed to ensure sprouting and sprout survival sufficient to perpetuate the long-term viability of the clones.
3. Within lynx habitats, the BLM shall ensure that livestock grazing in riparian areas and willow patches is managed to maintain or achieve mid seral or higher conditions to provide cover and forage for prey species.
4. On projects where over-snow access is required, the BLM shall ensure use is restricted to designated routes.
5. Predator control activities, including trapping or poisoning on domestic livestock allotments on federal lands within lynx habitat, shall be conducted by Wildlife Services personnel in accordance with USFWS recommendations established through a formal Section 7 consultation process.
6. The BLM shall ensure that the potential importance of shrub-steppe habitats in the lynx habitat matrix and in providing landscape connectivity between blocks of lynx habitats is evaluated and considered as integral to overall lynx habitats, where appropriate. Livestock grazing within shrub-

steppe habitats in such areas should be managed to maintain or achieve mid seral or higher conditions to maximize cover and prey availability. Such areas currently in late seral conditions should not be degraded.

7. In high-elevation riparian areas, especially those subject to grazing, the BLM shall ensure that weed assessments and weed control are conducted to optimize habitat for snowshoe hares.

Access

1. Within lynx habitats, the BLM shall ensure, using best available science, that key linkage areas and potential highway crossing areas are identified.
2. The BLM shall work cooperatively and proactively with the Federal Highway Administration and State Departments of Transportation to identify land corridors necessary to maintain connectivity of lynx habitats and map the location of "key linkage areas" where highway crossings may be needed to provide habitat connectivity and reduce mortality of lynx (and other wildlife).
3. Dirt and gravel roads traversing lynx habitats (particularly those that could become highways) should not be paved or otherwise upgraded (e.g., straightening of curves, widening of roadway, etc.) in a manner that is likely to lead to substantial increases in traffic volumes, traffic speeds, increased width of the cleared ROW, or would foreseeably contribute to development or increases in human activity in lynx habitats. Whenever rural dirt and gravel roads traversing lynx habitat are proposed for such upgrades, a thorough analysis should be conducted on the potential direct and indirect effects to lynx and lynx habitat.

Lands Management

1. The BLM shall ensure that proposed land exchanges, land sales, and special use permits are evaluated for effects on lynx habitats and key linkage areas.

Energy Development

1. If activities are proposed in lynx habitats, the BLM shall ensure that stipulations and conditions of approval for limitations on the timing of activities and surface use and occupancy are developed at the leasing and notice of staking/APD stages. For example, the BLM would require that activities not be conducted at night, when lynx are active, and avoid activity near denning habitats during the breeding season (April or May to July) to protect vulnerable kittens.
2. The BLM shall ensure that snow compaction is minimized when authorizing and monitoring developments, as well as encourage remote monitoring of sites located in lynx habitats so that they do not have to be visited daily.

Gray Wolf (Nonessential/Experimental)

These conservation measures are taken directly from the *Final Statewide Programmatic Biological Assessment: Gray Wolf* (*Canis lupis*) (BLM 2004a).

Because of the wolf's status in Wyoming as an experimental nonessential species under 10(j) of the ESA, conservation measures are not inherent in the recovery plan. Nor are there any in the 2003 (unapproved by USFWS) Wyoming State Management Plan for wolves (WGFD 2003). Wolves are very adaptable and have done very well in Wyoming since their release in 1995 and 1996. Two main factors affecting the continued existence of wolves in an area are the maintenance of a good ungulate prey base and the containment of roads and human activity. Habitat improvement projects for elk and other big game foraging areas are already part of the RMPs and one of the main activities carried out by individual field offices. The other significant factor is to reduce human-caused mortality. Road density (highly correlated with human causes of death), public outreach and education, and cattle-ranching practices as they relate to wolf depredations, are overarching elements in the maintenance of successful wolf populations.

The maintenance of a good database on the location of wolf packs is the first step in protecting animals. It is important to develop and maintain contact with appropriate staff with the USFWS and the WGFD to stay informed of wolf packs in the field offices and (or) on BLM land. Following delisting and as wolf populations expand, it may be necessary to develop monitoring protocols for wolves on BLM lands. Such protocols would be most effective when coordinated with other agencies.

These conservation measures are meant to be a tool to clarify what activities have impacted the species in the past, what conservation measures have been or could be used to minimize impacts, and to assist the agencies in the development of BAs and biological opinions. Implementing the following conservation strategies is intended to minimize adverse impacts likely to result from implementing management actions provided in the RMPs. The BLM has committed to implement conservation measures 1 through 5.

All conservation measures apply to the known populations of the gray wolf. In the event that wolf packs are formed in new areas, these measures would apply to these areas as well. The BLM is committed to implementing conservation measures 1 through 5 below.

1. No project actions are to be located within 100 meters (330 feet) of denning sites between April 1 and June 30. Areas within 0.8 kilometers (0.5 miles) of a denning site are recommended for protection from disturbance.
2. Actions will be taken to help reduce human-caused mortality wherever possible. For example, providing educational material, as appropriate, to avoid the inadvertent killing of a wolf mistaken for a coyote; providing information on compatible grazing practices (see # 3 below); avoiding situations that lead to the adoption of human foods and garbage by wolves, which could lead to a bite and subsequent elimination of the wolf.
3. Useful information will be disseminated to livestock producers on wolf/livestock interactions, alternate livestock practices that minimize conflicts between wolves and livestock (e.g., dispersed grazing rather than concentrated grazing), and compatible lambing and calving methods that reduce or eliminate wolf depredation in occupied habitats.
4. A BLM-representative will be designated to attend the annual Interagency Coordination Meeting.
5. The BLM will continue to attend the annual coordination meetings with the WGFD.

Yellow-billed Cuckoo (Candidate)

The following conservation measures are taken directly from the *Final Programmatic Biological Evaluation for the Western Yellow-billed Cuckoo (Coccyzus americanus)* in Wyoming (BLM 2003b).

Riparian Area Management

1. Consider carefully the affects to the yellow-billed cuckoo from any activities within or adjacent to cuckoo habitats.
2. Apply a 500-foot buffer through seasonal restriction to include the breeding season from May 15 through August 15 and apply rehabilitation standards in or adjacent to yellow-billed cuckoo habitat, when necessary.

3. Manage for a stable or increasing population of cottonwood/willow vegetation in yellow-billed cuckoo habitats. Ensure that all age classes are present (seedling, young, mature, and decadent), with more seedlings present than decadent plants, and more young plants than mature ones.
4. When planting trees, select only native species and avoid Russian olive and tamarisk (salt cedar).

Livestock Grazing Management

1. Use livestock management practices that minimize impacts to important cuckoo habitats. Examples of practices include planned grazing systems, riparian pasture fences, exclosures, herding, changes in class of livestock, timing and season of use, seasonal changes, managing use levels, off-site water and salting, resting for 1 or more years, and reduction in livestock numbers.
2. Improve livestock distribution and forage use by using salt and mineral blocks, but avoid placing them within riparian areas (keep them at least ¼ mile from streams) or in immediately adjacent uplands.
3. Locate livestock-handling facilities and collection points outside riparian areas. Branding, loading, and other handling efforts should be limited to areas and times that do not harm soils and plants in riparian zones.

General Construction Activities

1. Where roads, pipelines, and powerlines must be routed through riparian habitats, the construction work should not be accomplished from mid May to mid August, when the cuckoos are nesting.
2. Topography should be returned to its original condition to the greatest extent possible to ensure the hydrology remains intact.
3. Combine multiple roads and ROW to one stream-crossing site.
4. Maintain at least 100-foot buffer zones between riparian areas and mining, oil, gas, sand/gravel, and geothermal activities, including structures, roads, and support facilities.

Developed Recreation Areas

1. Boat and raft landing areas should not be developed in yellow-billed cuckoo habitats. (Discussed at April 18-19, 2003, Yellow-billed Cuckoo meeting in Rock Springs, Wyoming).
2. Outfitting camps should not be permitted in yellow-billed cuckoo habitat. (Discussed at April 18-19, 2003, Yellow-billed Cuckoo meeting in Rock Springs, Wyoming).

Pesticide Use

1. Restrict the use of foggers for insect control in yellow-billed cuckoo habitats, especially during the nesting season, so a food source remains available for birds.
2. Chemical insecticides should not be utilized within 500 feet of occupied yellow-billed cuckoo habitats, and chemical herbicides, which do not break down upon contact with soil or water, should be prohibited within 500 feet of riparian areas. Supposedly the use of Demolin to control grasshopper outbreaks does not move through ecological systems. The chemical is an agent that affects only the ability of young grasshoppers to develop an exoskeleton. It is applied only when a potential outbreak is identified and application would not reduce grasshopper numbers to lower than those during a non-outbreak year. Demolin does not affect insects, which do not have exoskeletons. BLM state weed coordinator, Ken Henke, recommends the following as a conservation measure: "Chemical insecticides should not be utilized in occupied cuckoo habitat. In case of a grasshopper outbreak, insecticides other than Demolin should not be utilized within yellow-billed cuckoo habitat. A quarter-mile buffer zone around active nests could be applied."

3. Chemical insecticides or herbicides, if used, should be applied by hand in yellow-billed cuckoo habitats and only in cases where insect invasion or noxious weed outbreak has the potential to degrade area ecological health.
4. In areas adjacent to yellow-billed cuckoo habitats, carefully plan aerial application of herbicides to prevent drift of chemicals into riparian areas

Prescribed Burning

1. Prescribed fire activities will be used only to maintain or enhance yellow-billed cuckoo habitats. Restrictions, such as for smoke dispersal heat intensity, buffer zones, or timing etc., will be incorporated into the fire plan and approved by a BLM biologist prior to conducting the burn. (Developed at April 18-19, 2003, Yellow-billed Cuckoo meeting in Rock Springs, Wyoming).

Wildlife Management

1. Maintain beaver populations where they occur in yellow-billed cuckoo habitats and encourage reintroduction into areas historically occupied by beavers in yellow-billed cuckoo habitats. (Discussed, along with BMPs, at April 18-19, 2003, Yellow-billed Cuckoo meeting in Rock Springs, Wyoming).

CONSERVATION AGREEMENTS

Plants

Ute Ladies'-tresses (Threatened)

No conservation agreements are identified for the Ute ladies'-tresses.

Fish

Colorado River Fishes (Endangered)

No conservation agreements are identified for the Colorado River fishers.

Wildlife

The following conservation agreements for the special status wildlife species within the planning area (bald eagle, black-footed ferret, grizzly bear, Canada lynx, gray wolf, and yellow-billed cuckoo) are identified in each species' respective statewide BA. In addition, the Kemmerer Field Office adheres to the *Final Report and Recommendations from the Wyoming State-wide Bighorn/Domestic Sheep Interaction Working Group* (Wyoming State-wide Bighorn/Domestic Sheep Interaction Working Group 2004), for conservation of bighorn sheep. To strengthen the cooperative approach to the management of wildlife and wildlife habitat on public land at all levels of the respective agencies, the BLM and the Wyoming Game and Fish Department entered into the *Umbrella Memorandum of Understanding Between Wyoming Game and Fish Department and U.S. Department of the Interior Bureau of Land Management (Wyoming) For Management of the Fish and Wildlife Resources on the Public Lands* (WGFD and BLM 1990).

Bald Eagle (Threatened)

As identified in the USFWS Biological Opinion (BLM 2004b), to monitor the impacts of site-specific projects authorized under the Wyoming statewide RMPs that are likely to adversely affect bald eagles, the BLM shall prepare a report describing the progress of each such site-specific project, including implementation of the associated reasonable and prudent measures and impacts to the bald eagle (50 CFR § 402.14[i][3]). The report, which shall be submitted annually to the USFWS's Wyoming Field Office by January 1 beginning after first full year of implementation of the Proposed Action, shall list and describe the following:

1. Adverse effects resulting from activities of each site-specific project
2. When and if any level of anticipated incidental take is approached (as allowed by separate Incidental Take Statements from site-specific formal consultations)
3. When and if the level of anticipated take (as allowed by separate Incidental Take Statements from site-specific formal consultations) is exceeded
4. Results of annual, periodic monitoring that evaluates the effectiveness of the reasonable and prudent measures. Include items such as
    a. assessment of whether implementation of each site-specific project is consistent with that described in the BA
    b. compliance with terms and conditions
    c. documentation of sightings of bald eagles during activities of each site-specific project.

The reasonable and prudent measures, with their implementing terms and conditions and the reporting criteria, are designed to minimize the impact of incidental take that might otherwise result from the authorized activities under the RMP. If, during the course of the authorized activities, any level of incidental take has exceeded that as permitted by site-specific formal consultations for bald eagles, such incidental take represents new information requiring reinitiating consultation and review of the reasonable and prudent measures provided. The BLM must immediately provide an explanation of the causes of the taking, and review with the USFWS the need for possible modification of the reasonable and prudent measures (Appendix Table F-2 of BA) (BLM 2003b) for estimation of activity levels as they correspond to buffer guidelines. Deviations may be made after consultation with the USFWS.

Black-footed Ferret (Endangered)

No conservation agreements have been identified for the black-footed ferret.

Grizzly Bear (BLM Sensitive)

No conservation agreements have been identified for the grizzly bear.

Canada lynx (Threatened)

No conservation agreements have been identified for the Canada lynx.

Gray Wolf (Nonessential/Experimental)

No conservation agreements have been identified for the gray wolf.

Yellow-billed Cuckoo (Candidate)

The follow conservation agreements are taken directly from the *Final Programmatic Biological Evaluation for the Western Yellow-billed Cuckoo (Coccyzus americanus)* in Wyoming (BLM 2003b).

While the BLM does not have any specific management programs or practices regarding the yellow-billed cuckoo (except for the directive to implement management plans that conserve candidate species and their habitats to ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed), they do have policies in place designed to protect the species' fragile riparian habitats. The following policies were extracted from the RMPs of the four BLM field offices located within the historical range of the Western yellow-billed cuckoo. Not all of these policies are specifically listed in all RMPs; however, for the most part, each is observed and practiced in each field office (Keith Andrews, Personal Communication).

1. No surface disturbance will be allowed within 500 feet of riparian habitats, wetland, and (or) live water unless a high potential for successful rehabilitation exists and (or) impacts will be temporary in nature (BLM-Pinedale Field Office RMP-Page 9, Kemmerer Field Office RMP-Pages 9 & 11, Green River RMP-Page 8, and Great Divide RMP-Page 48).
2. Objectives of the livestock management program in riparian areas will include maintenance, restoration, and improvement of riparian values where livestock grazing has contributed to riparian management problems (BLM-Pinedale Field Office RMP-Page 24, Green River RMP-Page 10, and Great Divide RMP-Page 24).
3. For forest management purposes no clear-cutting or tracked or wheel-type equipment operations will be allowed within a 100-foot buffer of riparian areas (Pinedale RMP-Page 29, Green River RMP-Page 8, and Kemmerer RMP-Page 33).
4. Riparian habitats will be maintained, improved, or restored to provide wildlife habitats, improve water quality, and enhance forage conditions. Where possible, acquisition of additional riparian area acreage will be pursued to enhance riparian area management (BLM—Green River RPM-Page 24, Pinedale RMP-Page 21, and Kemmerer RMP-Page 25).
5. When the BLM considers issuing a project or program the agency has a statutory responsibility under the National Environmental Policy Act to assess potential environmental impacts, including those to federally listed and candidate species under the ESA (Pinedale RMP-Page 21, Kemmerer RMP-Page 25, Green River RMP-Page ROD-1, and Great Divide RMP-Page 1).
6. The BLM also has the statutory authority under the Mineral Leasing Act of 1920, the Mineral Leasing Act for Acquired Lands, and FLPMA to take reasonable measures to avoid or minimize adverse environmental impacts that may result from federally authorized mineral lease activities. This authority exists regardless of whether the surface is federally owned (Pinedale RMP-Page 15 and Great Divide RMP-Page 1).

BLM-ENDORSED MANAGEMENT STRATEGIES

BLM-endorsed management strategies are governed by applicable laws, policies, and other requirements. Often, BLM-endorsed management strategies reflect BMPs as outlined in each species respective biological assessment. The BLM-endorsed management strategies for special status plant and wildlife species are identified below.

Plants

Ute Ladies'-tresses (Threatened)

The follow BLM-endorsed management strategies are taken directly from the *Final Report Statewide Programmatic Biological Assessment: Ute Ladies'-tresses Orchid* (*Spiranthes diluvialis*) (BLM 2005a). The following BMPs are to be considered on a case-by-case basis at the project level and implemented, where appropriate, to further protect the orchid.

1. When project proposals are received, the BLM will initiate coordination with the USFWS at the earliest possible date so that both agencies can advise on project design. This should minimize the need to redesign projects at a later date to include orchid conservation measures, determined as appropriate by the USFWS.

2. The BLM will participate in the development of both, a conservation agreement/assessment strategy and a species specific recovery plan for the orchid in coordination with the USFWS and other agencies, as appropriate. Orchid habitats on BLM-administered lands will be monitored to determine if recovery/conservation objectives are being met.
3. The BLM will coordinate with the USFWS, the National Resource Conservation Service, and private landowners to ensure adequate protection for the orchid and its habitats when new activities are proposed, and to work proactively to enhance the survival of the plant.
4. In the event that a new population of the orchid is found, the USFWS Wyoming Field Office (307-772-2374) will be notified within 1 week of discovery.
5. Livestock grazing, mowing/haying, and some burning are specific management tools that the BLM may use to maintain favorable habitat conditions for the orchid where feasible. Mowing and grazing, with proper timing and intensity, reduce the native and exotic plant competition for light and possibly for water, space, and nutrients.
6. To prevent loss of habitat for the orchid, the BLM "shall retain in Federal ownership all habitats essential for the survival and recovery of any listed species, including habitat that was used historically, that has retained its potential to sustain listed species, and is deemed to be essential to their survival." Prior to any land-tenure adjustments in *potential* orchid habitats, the BLM will survey to assess the potential for the existence of the orchid. While it is difficult to assess whether the orchid was historically present on such sites, the BLM should try and retain in Federal ownership all habitats essential for the survival and recovery of the orchid, including habitat that was used historically, that has retained its potential to sustain this listed species and is deemed to be essential to their survival. Potential orchid habitat may be used for reintroduction efforts and is important for the recovery and enhancement of the species.
7. Maintain and restore the dynamics of stream systems, including the movement of streams within their floodplains, which are vital for the life-cycle of the orchid. Flow timing, flow quantity, and water table characteristics should be evaluated to ensure that the riparian system is maintained where these plants occur.
8. Maintain and restore the natural species composition and structural diversity of plant communities in riparian zones and wetlands.
9. For the protection of the orchid and its potential habitats, surface-disturbing activities listed above should be avoided in the following areas when they occur outside the protective 0.25 buffer from populations of the orchid: (a) identified 100-year-old floodplains; (b) areas within 500 feet from perennial waters, springs, wells, and wetlands, and; (c) areas within 100 feet from the inner gorge of ephemeral channels.

Fish

Colorado River Fishes (Endangered)

No BLM-endorsed management strategies are identified for Colorado River Fishes.

Wildlife

The BLM-endorsed management strategies for the bald eagle, black-footed ferret, grizzly bear, Canada lynx, gray wolf, and yellow-billed cuckoo are identified below. These management strategies are identified in each species' respective statewide BA.

Bald Eagle (Threatened)

The following BLM-endorsed management strategies are taken directly from the final statewide programmatic Bald Eagle (*Haliaeetus leucocephalus*) BA (BLM 2003a).

Section 7(a)(1) of ESA directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that minimize or avoid adverse effects of a proposed action on listed species or critical habitats, help implement recovery plans, or develop information. The recommendations provided here relate to the proposed action only and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for these species.

1. The USFWS recommends that when project proposals are received, the BLM initiate coordination with the USFWS at the earliest possible date so that the USFWS can provide information on natural resource issues. This should minimize the need to redesign projects at a later date to include conservation measures that may be determined as appropriate by the USFWS.
2. The USFWS recommends that BLM-administered lands within 1 mile of an integral part of bald eagle habitats, including nests, communal winter roosts, and foraging/concentration areas, not be exchanged or sold. If it is imperative that these lands are transferred out of BLM ownership, then every effort should be made to include conservation easements or voluntary conservation restrictions around the important bald eagle habitats to restrict activities of the property and protect the bald eagles from disturbance and their habitat from destruction.
3. The USFWS recommends that proponents of BLM-authorized actions be advised that roadside carrion can attract foraging bald eagles and potentially increase the risk of vehicle collisions with bald eagles feeding on carrion. When large carrion occurs on the road, appropriate officials should be notified for necessary removal.
4. The USFWS recommends that BLM coordinate with APHIS - Wildlife Services Division to minimize potential impacts to the bald eagle and its habitats from pest/predator control programs that may be included in the local animal damage control plan. The USFWS also should be included in this coordination.
5. The USFWS recommends that proposed and future water projects not be designed to discharge into drainages or reservoirs occurring within 500 feet of county roads and highways. This measure is intended to (1) minimize vehicle collisions with wildlife using the water source, and (2) minimize the occurrence of eagle-vehicle collisions resulting from eagles feeding on road-killed wildlife.
6. The USFWS recommends that BLM provide educational information to project proponents and the public pertaining to the following topics: appropriate vehicle speeds and the associated benefit of reduced vehicle collisions with wildlife; use of lead shot (particularly over water bodies); use of lead fishing weights; and general ecological awareness of habitat disturbance.
7. The USFWS recommends that BLM coordinate with other agencies and private landowners to identify voluntary opportunities to modify current land stewardship practices that may impact the bald eagle and its habitats.
8. Since bald eagles often depend on aquatic species as prey items, the USFWS recommends that BLM periodically review existing water quality records (e.g., Wyoming Department of Environmental Quality (WDEQ), WGFD, U.S. Geological Survey (USGS), etc.) from monitoring stations on, or near, important bald eagle habitats (i.e., nests, roosts, concentration areas) on public land for any conditions that could adversely affect bald eagles or their prey. If water

quality problems are identified, the BLM should contact the appropriate jurisdictional entity to cooperatively monitor the condition and (or) take corrective action.

9. The USFWS recommends that BLM projects with the potential to disturb bald eagles should be implemented in the least amount of time and during periods least likely to affect the bald eagle.

For the USFWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the USFWS requests notification of the implementation of any conservation recommendations.

Black-footed Ferret (Endangered)

The following BLM-endorsed management strategies are taken directly from the *Final Statewide Programmatic Biological Assessment: Black-footed Ferret* (*Mustela nigripes*) (BLM 2005b).

1. Develop prairie dog management plans with ongoing monitoring and protection of prairie dog towns and complexes on towns with high priority for black-footed ferret reintroductions.
2. Follow the guidelines outlined in the *Wyoming Black-tailed Prairie Dog Management Plan* and the *White-tailed Prairie Dog Conservation Assessment*. Encourage the Wyoming Board of Agriculture to give regulatory management of prairie dogs to the WGFD to remove the unprotected “pest” status on prairie dogs and provide regulatory mechanisms for recreational shooting of prairie dogs.
3. Establish land-stewardship agreements with other agencies and (or) private landowners where large (1,000-acre) prairie dog towns or complexes exist. These agreements can control potential uses that may be detrimental to prairie dogs and their habitats, while preserving the landowner’s intent for use.
4. Avoid sale or exchange of lands with the potential for black-footed ferret reintroductions and attempt to acquire parcels with prairie dogs on them, especially those that have potential as part of a black-footed ferret reintroduction effort.
5. Initiate, to the extent feasible, land exchanges in the Thunder Basin and Shirley Basin in areas with potential for black-footed ferrets, to increase the land area in federal ownership.
6. Avoid vegetation stand conversions that have been shown to be detrimental to prairie dogs, and reduce or eliminate any other suspected ecosystem-degrading practices.
7. Encourage, support, and (or) establish a prairie dog research program, addressing issues such as the effect of recreational shooting and oil and gas development on prairie dogs, sylvatic plague control, and population viability analysis.
8. Because knowledge of the effects of resource extraction on white-tailed prairie dog populations is limited, monitoring at sites before, during, and after energy development is recommended (Seglund et al. 2004).

Grizzly Bear (BLM Sensitive)

The following BLM-endorsed management strategies are taken directly from the *Final Statewide Programmatic Biological Assessment: Grizzly Bear (Ursus arctos)* (BLM 2005c).

1. To reduce potential conflicts between grizzly bears and livestock, the BLM should phase out sheep allotments in occupied grizzly bear habitats as opportunity arises. Existing sheep allotments in occupied grizzly bear habitats should be monitored and evaluated for conflicts between grizzly bears and sheep. The BLM should offer no new permitted sheep Animal Unit

Months (AUMs) in grizzly bear habitats where conflicts have occurred in the past, or are likely to occur in the future.

2. The BLM should adjust management of domestic livestock on public land allotments or leases to minimize grizzly bear and livestock conflicts (such as season of use, class of livestock, etc.).
3. The BLM should include a clause on all use authorizations that allows for permanent cancellation, temporary cancellation, or temporary cessation of activities if such are needed to resolve a grizzly bear and human conflict situation.
4. Wherever possible, the BLM should reduce motorized access routes in occupied grizzly bear habitats and try to avoid authorizing any new motorized access in occupied grizzly bear areas (i.e., big game ranges).
5. Wherever possible, the BLM will implement appropriate closures or seasonal restriction areas to cross-country motorized travel to provide more security in occupied grizzly bear habitats.
6. Where possible, maintain road densities of less than 1 mile per square mile in occupied grizzly bear habitats. Where existing road densities are currently below 1 mile per square mile, avoid increases in road density to maintain management options and secure habitat. Consider all big game winter range areas as areas where road density objectives are less than 1 mile of road per square mile.
7. The BLM should initiate a habitat mapping and monitoring effort for the grizzly bear. Habitat mapped on BLM lands will be done using Geographic Information System (GIS) technology. Secure habitat, open motorized access route density (roads that are actively used) greater than 1 mile per square mile, and total motorized access route density (includes all roads, even gated roads) greater than 2 miles per square mile will be monitored utilizing the Yellowstone Grizzly Bear Cumulative Effects Model GIS databases, and will be reported annually, as is described in and conducted in the PCA.
8. In areas of vital importance to grizzly bears (known denning areas, army cutworm moth aggregations, cutthroat trout spawning sites, spring ungulate concentration sites, etc.), activities that adversely affect grizzly bear populations and (or) their habitats should be avoided. Adverse habitat effects could result from land surface disturbances; water table alterations; reservoirs, ROW, roads, pipelines, canals, transmission lines, or other structures; increased human foods; and reduced availability of natural foods. Areas of vital importance to grizzlies are identified through the evaluation process described in the *Grizzly Bear Management Guidelines*.

Canada Lynx (Threatened)

The following BLM-endorsed management strategies are taken directly from the *Final Statewide Programmatic Biological Assessment: Canada Lynx* (*Lynx canadensis*) (BLM 2005d).

1. Design regeneration prescriptions to mimic historical fire (or other natural disturbance) events, including retention of fire-killed trees and coarse woody debris.
2. Design harvest units to mimic the pattern and scale of natural disturbances and retain natural connectivity across the landscape. Evaluate the potential of riparian zones, ridges, and saddles to provide connectivity.
3. Provide for continuing availability of foraging habitat in proximity to denning habitats.
4. In areas where recruitment of additional denning habitats is desired, or to extend the production of snowshoe hare foraging habitats where forage quality and quantity is declining due to plant succession, consider improvement harvests (commercial thinning, selection, etc). Improvement

harvests should be designed to retain and recruit the understory of small-diameter conifers and shrubs preferred by hares; retain and recruit coarse woody debris, consistent with the likely availability of such material under natural disturbance regimes; and maintain or improve the juxtaposition of denning and foraging habitats.

5. Provide habitat conditions through time that support dense horizontal understory cover and high densities of snowshoe hares. This includes, for example, mature multistoried conifer vegetation. Focus vegetation management, including forest management and use of prescribed fire, in areas that have the potential to improve snowshoe hare habitats (dense horizontal cover), but that presently have poorly developed understories with little value to snowshoe hares.
6. Design burn prescriptions to promote response by shrub and tree species favored by snowshoe hare and thus regenerate or create snowshoe hare habitats (e.g., regeneration of aspen and lodgepole pine).
7. Design burn prescriptions to retain or encourage tree species composition and structure that will provide habitats for red squirrels or other alternate prey species.
8. Consider the need for pretreatment of fuels before conducting management ignitions.
9. Design burn prescriptions and, where feasible, conduct fire-suppression actions in a manner that maximizes lynx denning habitats.
10. Map and monitor the location and intensity of snow-compacting activities (for example, snowmobiling, snowshoeing, cross-country skiing, dog sledding, etc.) that coincide with lynx habitats to facilitate future evaluation of effects on lynx as information becomes available. Discourage recreational use in areas where it is shown to compromise lynx habitats. Such actions should be undertaken on a priority basis considering habitat function and importance.
11. Provide a landscape with interconnected blocks of foraging habitat where snowmobile, cross-country skiing, snowshoeing, or other snow-compacting activities are minimized or discouraged.
12. Identify and protect potential security habitats in and around proposed developments or expansions.
13. Determine where high total road densities (>2 miles per square mile) coincide with lynx habitats and prioritize roads for seasonal restrictions or reclamation in those areas.
14. Minimize roadside brushing to provide snowshoe hare habitats.
15. Limit public use on temporary roads constructed for timber sales. Design new roads, especially entrances, for effective closure upon completion of sale activities.
16. Limit public use on temporary and permanent roads constructed for access to timber sales, mines, and leases. Design new roads, especially entrances, for effective closure. Upon project completion, reclaim or obliterate these roads.
17. Minimize road building directly on ridgetops or areas identified as important for lynx habitat connectivity.
18. To reduce accidental shooting of lynx, initiate and (or) augment interagency information and education efforts throughout the range of lynx in the contiguous states. Utilize trailhead posters, magazine articles, news releases, state hunting and trapping regulation booklets, and so on to inform the public of the possible presence of lynx, field identification, and their status.
19. Where needed, develop measures, such as wildlife fencing and associated underpasses or overpasses, to reduce mortality risk.
20. Where feasible within identified key linkage areas, maintain or enhance native plant communities

and patterns and habitat for potential lynx prey. Pursue opportunities for cooperative management with other landowners. Evaluate whether land ownership and management practices are compatible with maintaining lynx highway crossings in key linkage areas. On public lands, management practices will be compatible with providing habitat connectivity. On private lands, agencies will strive to work with landowners to develop conservation easements, exchanges, or other solutions.

21. Dirt and gravel roads traversing lynx habitats (particularly those that could become highways) should not be paved or otherwise upgraded (e.g., straightening of curves, widening of roadway, etc.) in a manner that is likely to lead to substantial increases in traffic volumes, traffic speeds, increased width of the cleared ROW, or would foreseeably contribute to development or increases in human activity in lynx habitats. Whenever rural dirt and gravel roads traversing lynx habitats are proposed for such upgrades, a thorough analysis should be conducted on the potential direct and indirect effects to lynx and lynx habitats.
22. In land-adjustment programs, identify key linkage areas. Work toward unified management direction via habitat conservation plans, conservation easements or agreements, and land acquisition.
23. Plan recreational development, and manage recreational and operational uses to provide for lynx movement and to maintain effectiveness of lynx habitats.
24. Identify, map, and prioritize site-specific locations using topographic and vegetation features to determine where highway crossings are needed to reduce highway impacts on lynx.
25. Using best available science, develop a plan to protect key linkage areas on federal lands from activities that would create barriers to lynx movement. Barriers could result from an accumulation of incremental projects, as opposed to any one project.
26. When opportunities for vegetation treatments come up, develop treatments that provide or develop characteristics suitable for snowshoe hare.
27. Protect existing snowshoe hare and red squirrel habitats.

Gray Wolf (Nonessential/Experimental)

The following BLM-endorsed management strategies are taken directly from the *Final Statewide Programmatic Biological Assessment: Gray Wolf* (*Canis lupis*) (BLM 2004a).

1. Avoid an increase in miles of road in elk crucial winter range.
2. Avoid situations that allow for wolves to habituate to humans, or become exposed to and use human refuse as a food source.
3. Foster public outreach/education programs to provide information on wolves in schools, campgrounds, and other places. Topics can include, but are not limited to, how to be safe around wolves, wolf ecology, wolf mortality factors, and livestock grazing practices harmful to wolves.
4. Continue to support the research and documentation of wolf/livestock interactions and livestock grazing practices to improve these practices so they are more compatible with wolves.
5. Continue to provide and improve wolf habitats by monitoring elk populations and improving habitats for elk.
6. Encourage reporting of wolf observations by BLM staff and the public to WGFD.

Yellow-billed Cuckoo (Candidate)

The follow BLM-endorsed management strategies are taken directly from the Final Programmatic Biological Evaluation for the Western Yellow-billed Cuckoo (*Coccyzus americanus*) in Wyoming (BLM 2003b).

Riparian Habitat Management

1. All riparian areas of 20 hectares or more should be managed to preserve, protect, and, if necessary, restore natural functions in compliance with Executive Orders 11988 (requires agencies to preserve natural values served by floodplains) and 11990 (requires avoidance of adverse impacts associated with destruction or modification of wetlands), with the objective of minimizing degradation of stream banks and the loss of riparian habitats.
2. Where possible, acquisition of additional riparian area acreage should be pursued to enhance riparian area management per Executive Orders 11988 and 11990.
3. Stabilize and protect eroding stream banks in cuckoo habitats. Activities that could erode the stream bank should be restricted.
4. When possible, fence occupied cuckoo habitats to exclude livestock where livestock grazing is determined to impede regeneration of the habitats.
5. Improve adjacent upland forage to lure livestock out of riparian areas.
6. Develop shade and water (wells, windmills, guzzlers, or water piped from the stream) in upland areas to help spread grazing pressure. Provide escape ramps in water tanks to prevent drowning.

General Construction Activities

1. ROW should be placed near current habitat edge areas to reduce fragmentation of larger blocks of pristine habitats.
2. Avoid building roads or new trails parallel to streams in riparian zones or through wet meadows. Stream crossings should be at right angles to minimize impacts on riparian vegetation, stream banks, soils, and water quality.
3. Avoid straightening or diverting sections of stream channels. These activities increase stream velocity and erosion, reduce stream bank stability, and adversely affect upstream and downstream habitats.

Developed Recreation Areas

1. Promote "Tread Lightly" recreation ethics. Educate recreationists about problems humans can cause in riparian habitats and how they can avoid damaging these areas.
2. Plant dense native vegetation, such as willows, to screen and reduce human use of fragile or vulnerable riparian areas.

Pesticide Use

1. The BLM should work with APHIS and the USFWS to select a pesticide and method of application that would most effectively manage the insect infestation and least affect the yellow-billed cuckoo. Where possible, biological control should be used rather than chemical control.

Water Use

1. Avoid depleting groundwater and diverting streams outside their natural stream channels.

Lands and Realty

1. Lands containing occupied cuckoo habitats should not be sold or exchanged. If lands containing yellow-billed cuckoo habitats are exchanged, sold, or acquired, a strategy to protect the species should be developed. (Developed at April 18-19, 2003, Yellow-billed Cuckoo meeting in Rock Springs, Wyoming).

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KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX B

Priority Use and Management of Forage Reserve Areas

Appendix B
Priority Use and Management of Forage Reserve Areas

Forage Reserve Allotments

Program Criteria

The program would require voluntary relinquishment of grazing privileges to accommodate the specific use. Permittee/lessee use of forage reserve allotments will be voluntary. There are no exceptions to the voluntary provisions in this program.

Priority Criteria for Use of Forage Reserve Area

1. For deferment of prescribed burns conducted in accordance with approved allotment management plans
2. For temporary deferment of critical riparian areas in allotments where an approved management plan is in place
3. On allotments subject to wildfire
4. On allotments subject to insect infestation
5. To any Kemmerer Field Office permittee/lessee.

When one or more – allocate to

1. Operator making the highest contribution to the allotment being deferred
2. Operator who has not used the forage reserve most recently.

Forage reserve allotment offered 3 years out of 4.

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KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
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APPENDIX C

Public Involvement, Consultation, and Coordination

Appendix C
Public Involvement, Consultation, and Coordination

Public involvement, consultation, and coordination occurred prior to and throughout preparation of the Kemmerer Resource Management Plan (RMP) revision and associated Draft Environmental Impact Statement (EIS). This appendix describes the public involvement process, as well as other key consultation and coordination activities undertaken to prepare the Draft EIS in support of the RMP revision.

The Bureau of Land Management (BLM) decisionmaking process is conducted in accordance with the requirements of the National Environmental Policy Act (NEPA), Council on Environmental Quality (CEQ) regulations implementing NEPA, and the U.S. Department of the Interior (USDI) and BLM policies and procedures implementing NEPA. NEPA and the associated regulatory and policy framework require that all federal agencies involve the interested public in their decisionmaking, consider reasonable alternatives to proposed actions, and prepare environmental documents that disclose the potential impacts of proposed actions and alternatives.

The BLM accomplished public involvement, consultation, and coordination through public meetings, informal meetings, individual contacts, news releases, newsletters, workshops, a planning website, and the *Federal Register*. A Notice of Intent (NOI) published in the *Federal Register* on June 16, 2003, formally announced that the BLM Kemmerer Field Office was preparing an RMP and associated EIS. Publication of the NOI initiated the scoping process and invited participation of affected and interested agencies, organizations, and members of the public in determining the scope and issues to be addressed by alternatives and analyzed in the EIS. The BLM solicited additional public involvement to help identify issues to be addressed in developing a full range of land management alternatives (see Public Involvement Section below).

PUBLIC INVOLVEMENT

In accordance with CEQ scoping guidance, the BLM provided avenues for public involvement as an integral part of revising the RMP and preparing the Draft EIS. CEQ scoping guidance defines scoping as the “process by which lead agencies solicit input from the public and interested agencies on the nature and extent of issues and impacts to be addressed and the methods by which they will be evaluated” (CEQ 1981). The scoping report, which summarizes issues identifies during the scoping process, is available on the Kemmerer RMP website at www.blm.gov/rmp/kemmerer/.

The intent of the scoping process is to provide an opportunity for the public, tribes, other government agencies, and interest groups to scope the planning process and to identify planning issues to be addressed by alternatives or analyzed in the EIS. In general, public involvement assists the agencies through the following.

- Broadening the information base for decisionmaking
- Informing the public about the Draft EIS and proposed RMP and the potential impacts associated with various management decisions
- Ensuring public needs and viewpoints are brought to the attention of the agency

Scoping Period

Publication of the NOI on June 16, 2003, announced the BLM's intention to revise the Kemmerer RMP and prepare a Draft EIS. Scoping for the RMP revision and Draft EIS took place from June 16, 2003, to November 26, 2003. BLM resource management regulations require a 30-day scoping period; however, the Kemmerer revision scoping period remained open for 5 months.

The BLM utilized the public scoping process to identify planning issues to direct (drive) the formulation of alternatives and to frame the scope of analysis in the EIS. The scoping process also was used to introduce the public to preliminary planning criteria, which set limits to the scope of the RMP revision. Fifty-four comment letters were received during the scoping period. The scoping report provides a general summary of the issues found in these letters.

Scoping Notice

The BLM prepared a public scoping notice and mailed the notice to 779 federal, state, and local agencies, interest groups, and members of the public on October 27, 2003. In the scoping notice, the BLM solicited written comments on the RMP revision process, issues, and impacts and invited the public to a series of three public scoping meetings held throughout the planning area. The scoping notice served to remind the public of the opportunity to view the Summary of the Management Situation Analysis (MSA), the project schedule, and other relevant project information on the Kemmerer RMP website. In addition, the scoping notice provided general information on the planning area, background information on the planning process, and dates and locations scheduled for the public scoping meetings.

Scoping Meetings

Public scoping meetings were held in Kemmerer, Evanston, and Rock Springs, Wyoming, on November 17, 18, and 19, 2003, respectively (Table C-1). The BLM structured the meetings in an open-house format, with two formal presentations made by the Kemmerer Field Office Assistant Manager for Resources. Resource specialists and other representatives of the BLM were on hand to personally address questions and provide information to meeting participants. The BLM provided four fact sheets, a summary of the MSA, and a series of four display boards at each scoping meeting. The BLM encouraged attendees to comment using a variety of media, including written comment forms, flip charts, planning area maps, and a computer kiosk.

Table C-1. Public Involvement, Coordination, and Consultation Meetings (2003)

Date	Location	Type of Meeting
November 17, 2003	Kemmerer, Wyoming	Public Scoping Meeting
November 18, 2003	Evanston, Wyoming	Public Scoping Meeting
November 19, 2003	Rock Springs, Wyoming	Public Scoping Meeting

Opportunities to Comment

The BLM provided a variety of avenues through which the public could comment during the scoping period. These avenues are listed below.

- **Mail** – The NOI and the scoping notice invited interested parties to submit comments by mail to the Kemmerer Field Office.
- **E-mail** – The NOI provided the following e-mail address for submitting comments electronically: krmpwymail@blm.gov.

- **Online** – The Kemmerer RMP revision website at www.blm.gov/rmp/kemmerer/ was launched on November 3, 2003. The website provides history about the project, a project schedule, a document library, a mailing-list screen, and a comment screen. During the comment period, the public could enter their comments on the website and submit them electronically. The capability to submit comments via the website will continue through the 90-day comment period for the Draft EIS.
- **Telephone** – The scoping notice and all four fact sheets provided a phone number so interested parties could call and submit leave oral comments.
- **In Person at the Scoping Meetings** – The BLM provided the public the opportunity to comment at all three public meetings. Comment methods included a computer kiosk, through which interested individuals could type their comments; comment forms that could be filled out and submitted at the meetings or mailed in at a later date; and flip charts for expressing comments and concerns to share with the BLM and with other members of the public.

Mailing List

The project mailing list for the public scoping process was initially developed from the Kemmerer Field Office mailing list, but was updated throughout the planning process. The BLM encouraged scoping meeting participants to add their names to the mailing list. Some individuals added their names and addresses to the project mailing list by registering on the project website, as well as through personally contacting the BLM. Currently, the Kemmerer Field Office mailing list includes 845 addresses.

Newsletters

Periodic newsletters have been and are being developed and distributed to keep the public informed of the Kemmerer RMP revision process. The January 2004 newsletter provided basic background information on the project, including the purpose and need for updating the RMP and issues that the plan may address. The newsletter also extended an invitation to the public to be involved in the process, advertised the Kemmerer RMP revision website, and summarized public scoping comments.

A second newsletter (summer 2006) described the development of the alternatives, the process of selecting a preferred alternative, announced the schedule of the Draft EIS, and offered avenues for public involvement. A third newsletter was distributed in June 2007, prior to the release of the Draft EIS, to announce the publication of the Draft EIS, and to provide details on how to provide comments.

Website

The Kemmerer RMP revision website is located at www.blm.gov/rmp/kemmerer/. The site serves as a virtual repository for documents related to the development of the RMP revision, including announcements, bulletins, and documents. These documents are available in PDF format to ensure that they are available to the widest range of interested parties. The website gives the public the opportunity to submit their comments for consideration as part of the planning process. The website also offers the public an opportunity to be added to the project mailing list.

Future Public Involvement

Public participation will continue throughout the remainder of the planning process. Members of the public will have the opportunity to comment on the content of the Draft EIS during the specified comment period. The Final EIS will consider all substantive oral and written comments received during the 90-day public comment period. The Record of Decision will be issued by the BLM after the release of the Final EIS, the Governor's Consistency Review, and protest resolution.

CONSULTATION AND COORDINATION

This section documents the consultation and coordination efforts undertaken by the BLM throughout the process of revising the RMP and developing the Draft EIS. Title II, Section 202, of the Federal Land Policy and Management Act (FLPMA) directs the BLM to coordinate planning efforts with Native American tribes, other federal departments, and agencies of the state and local governments as part of its land use planning process. The BLM is directed to integrate NEPA requirements with other environmental review and consultation requirements to reduce paperwork and delays (40 Code of Federal Regulations 1500.4-5). The BLM accomplished coordination with other agencies and consistency with other plans through ongoing communications, meetings, and collaborative efforts with the Interdisciplinary Team, which includes BLM specialists and federal, state, and local agencies.

Cooperating Agencies

The Kemmerer Field Office extended cooperating agency status to the State of Wyoming, Lincoln County, Uinta County, Sweetwater County, U.S. Bureau of Reclamation various conservation districts, and tribal governments. The BLM invited these entities to participate because they have jurisdiction by law or because they could offer special expertise. A list of the cooperating agencies that have actively participated in cooperators' meetings leading up to the development of the RMP revision and Draft EIS include the following:

Local Governments

- Lincoln County Commissioners
- Lincoln County Conservation District
- Uinta County Commissioners
- Uinta County Conservation District
- Sweetwater County Commissioners
- Sweetwater County Conservation District

State of Wyoming

- State Historic Preservation Office
- Department of Agriculture
- Department of Environmental Quality
- Game and Fish Department
- Office of State Lands and Investments
- State Planning Coordinator's Office

Federal Government

- Bureau of Reclamation

BLM formally invited the cooperating agencies to participate in developing the alternatives and to provide existing data and other information relative to their agency responsibilities, goals, mandates, and expertise. Cooperating agencies provided input during the initial scoping process on issues of special expertise or legal jurisdiction. In addition, cooperating agencies participated in a series of alternative formulation workshops, reviewed draft information and documents, and met with BLM management and resource specialists periodically throughout the revision process to discuss planning issues and provide input to the process. Table C-2 lists these meetings and workshops.

Table C-2. Meetings with Cooperating Agencies

Date	Location	Type of Meeting
January 28, 2004	Kemmerer, Wyoming	Meeting with Shoshone-Bannock Tribes for an Overview of the RMP Process
February 2-6, 2004	Kemmerer, Wyoming	Workshop #1: Alternative Development (All Cooperating Agencies)
February 23-27, 2004	Kemmerer, Wyoming	Workshop #2: Alternative Formulation (All Cooperating Agencies)
April 12, 2004	Kemmerer, Wyoming	Meeting with Shoshone-Bannock Tribes Technical Staff and Business Council
June 29-30, 2004	Kemmerer, Wyoming	Field Manager's Meeting with Shoshone-Bannock and Eastern Shoshone Tribes
December 13-15, 2004	Kemmerer, Wyoming	Workshop #3: Cooperators' Input for the Preferred Alternative (All Cooperating Agencies)
April 20-21, 2005	Kemmerer, Wyoming	Field Manager's Open House Meeting with Cooperators
May 11, 2005	Kemmerer, Wyoming	Cooperating Agency Work Session
September 14-15, 2005	Kemmerer, Wyoming	Workshop #4: Preferred Alternative Formulation (All Cooperating Agencies)
September 26-30, 2005	Kemmerer, Wyoming	Cooperating Agency Work Session
October 31 - November 2, 2006	Kemmerer, Wyoming	Review of comments on Preliminary Draft RMP/EIS Version 1

Section 7 Consultation

The Kemmerer Field Office contacted the U.S. Fish and Wildlife Service (USFWS) regarding Section 7 of the Endangered Species Act. The BLM sent a letter to the USFWS concerning the Section 7 consultations, presenting the method and approach of how consultation would be conducted and providing details on the process of Programmatic Species-Specific Section 7 Consultations on Wyoming BLM RMPs. The USFWS provided the following lists as a general reference for the Kemmerer Field Office when evaluating BLM Section 7 responsibilities:

- List of Endangered, Threatened, and Candidate species for the Bureau of Land Management, Kemmerer Field Office, dated March 17, 2004.
- Endangered, Threatened, Proposed and Candidate Species, and Designated Critical Habitat in Wyoming State, dated March 23, 2004.

Consultation letters between the USFWS and the Kemmerer Field Office are located at the end of this appendix. The Kemmerer Field Office will continue consulting with the USFWS through completion of the final biological assessment and final RMP.

Native American Interests

Consultation with Native American tribes is part of the NEPA scoping process and a requirement of FLPMA. The Kemmerer Field Office took multiple steps to contact the tribes and include them in the scoping process. On September 12, 2003, the BLM sent letters to the following tribes inviting them to be a part of the planning process through consultation and public scoping meetings, as well as requesting information to be considered in the planning process:

- Eastern Shoshone Tribes
- Northern Arapaho Tribes
- Northern Ute Tribes
- Shoshone-Bannock Tribes.

Following the scoping process, the BLM sent a letter to each of the above-listed tribes on November 21, 2003, requesting specific information to identify areas of special concern for the tribes. The letter also offered the opportunity for meetings or field trips between representatives from the tribes and the Kemmerer Field Office. Representatives from the Kemmerer Field Office followed up on these letters with telephone calls to each tribe. In the letters and during the follow-up telephone calls, the BLM stressed the need for the tribes to review and comment on the Draft EIS.

Representatives of the Kemmerer Field Office met with members of the Shoshone-Bannock tribes several times to solicit input from the tribes concerning the RMP revision. A meeting with Shoshone-Bannock Technical Staff on January 28, 2004, included the BLM giving an overview of the RMP process, a description of land use planning procedures, and a PowerPoint presentation outlining some of the major issues that will be addressed in the RMP. A similar meeting was held on April 12, 2004; however, on this occasion, the BLM presentation was given before a larger group of representatives from the Shoshone-Bannock tribe, representing several technical staff departments and including four of the seven Business Council members. Members of the Shoshone-Bannock and Eastern Shoshone tribes met with representatives from the Kemmerer Field Office on June 29 and 30, 2004, to discuss the RMP revision. The tribes received maps of the general locations of cultural and spiritual interest to the tribes, as well as a tour of the planning area. Native American consultation letters can be found at the end of this appendix.

DISTRIBUTION LIST

A copy of the Draft EIS will be distributed to the following governments, individuals, and institutions:

Tribal Governments

- Eastern Shoshone Tribes
- Northern Arapaho Tribes
- Northern Ute Tribes
- Shoshone-Bannock Tribes

Local Governments (Counties, Cities, Towns)

Lincoln County, Wyoming

- Lincoln County Commissioners
- Lincoln County Conservation District

Uinta County, Wyoming

- Uinta County Commissioners
- Uinta County Conservation District

Sweetwater County, Wyoming

- Sweetwater County Commissioners
- Sweetwater County Conservation District

Wyoming State Agencies

- Historic Preservation Office
- Department of Agriculture
- Department of Environmental Quality
- Game and Fish Department
- State Geological Survey
- Office of State Lands and Investments
- Planning Coordinator's Office

Wyoming State Boards/Commissions

- Air Quality Advisory Board
- Board of Wildlife Commissioners
- Natural Gas Pipeline Authority
- Agriculture Board
- Environmental Quality Council
- Farm Bureau Federation
- Land Quality Advisory Board
- Livestock Board
- Mining Council
- Oil and Gas Conservation Commission
- Recreation Commission
- State Board of Outfitters and Professional Guides
- State Grazing Board
- Trails Council

Associations/Councils

- Coalbed Methane Coordination Coalition
- Mormon Trails Association
- Oregon-California Trails Association
- Petroleum Association of Wyoming
- Powder River Basin Resource Council
- Wildlife Habitat Council
- Wyoming Association of Municipalities
- Wyoming County Commissioners Association
- Wyoming Mining Association
- Wyoming Natural Diversity Database
- Wyoming Outdoor Council
- Wyoming Sportsmen's Association
- Wyoming Stockgrowers Association
- Wyoming Wilderness Association
- Wyoming Woolgrowers Association
- Independent Petroleum Association of Mountain States

Clubs/Alliances/Societies/Groups

- American Lands Alliance
- Animal Protection Institute of America
- Audubon Society
- Audubon Wyoming
- Biodiversity Conservation Alliance
- Defenders of Wildlife
- Earthjustice
- Environmental Defense
- Foundation for North American Wild Sheep
- Friends of Fort Bridger
- Independent Petroleum Association of Mountain States
- Humane Society of the United States
- Jackson Hole Conservation Alliance
- Medicine Butte Wildlife Association
- Natural Resources Defense Council
- National Trust for Historic Preservation
- National Wildlife Federation
- People for the USA
- People for Wyoming
- Rocky Mountain Elk Foundation
- Sierra Club (Northern Plains and Wyoming Chapters)
- Southwest Wyoming Dirt Riders
- Southwest Wyoming Industrial Association
- Southwest Wyoming Mineral Association
- Sportsmen for Fish and Wildlife – Star Valley
- Sweetwater Wildlife Association
- The Fund for Animals
- The Land and Water Fund of the Rockies
- The Land Trust Alliance
- The Nature Conservancy
- The Mule Deer Foundation (Western and Southwest Wyoming)
- The Wilderness Society
- The Wildlife Society
- Trout Unlimited
- Wyoming Advocates for Animals
- Wyoming Nature Conservancy
- Wyoming Wildlife Federation

Congressional Delegation

- U.S. Senator Mike Enzi
    - Washington, D.C.
    - Jackson, Wyoming
- U.S. Senator Craig Thomas
    - Washington, D.C.
    - Rock Springs, Wyoming
- U.S. Representative Barbara Cubin
    - Washington, D.C.
    - Rock Springs, Wyoming

U.S. Department of the Interior Agencies

- Bureau of Indian Affairs
- U.S. Bureau of Reclamation
    - Washington, D.C.
    - Provo, Utah
- Minerals Management Service
- National Park Service
    - Washington, D.C.
    - Denver, Colorado
    - Kemmerer, Wyoming
- Office of Environmental Policy and Compliance
- Natural Resources Library
- Office of Surface Mining
- U.S. Fish and Wildlife Service
    - Washington, D.C.
    - Denver, Colorado
    - Cheyenne, Wyoming
- U.S. Geological Survey
    - Washington, D.C.
    - Cheyenne, Wyoming
- Bureau of Land Management
    - Washington, D.C.
    - Wyoming State Office
    - Wyoming Field Offices
      Buffalo, Casper, Cody, Lander, Newcastle, Pinedale, Rawlins, Rock Springs, and Worland

Other Federal Agencies

- U.S. Environmental Protection Agency
- U.S. Department of Agriculture
  Forest Service
    Big Horn National Forest
    Bridger-Teton National Forest
    Medicine Bow/Routt National Forest
    Shoshone National Forest
  Natural Resources Conservation Service
    - Casper, Wyoming
    - Baggs, Wyoming
- U.S. Army Corp of Engineers
- U.S. Department of Energy
  Western Area Power Administration
    - Loveland, Colorado
    - Lakewood, Colorado
- Federal Highway Administration
- Federal Energy Regulatory Commission
- U.S. Government Printing Office
- Oceanic and Atmospheric Administration's National Weather Service

Libraries

- Library of Congress
- University of Wyoming Library
- Lincoln County Public Library
- Sweetwater County Public Library
- Sublette County Library
- Uinta County Public Library
- Western Wyoming College Library

Educational Institutions

- Eastern Wyoming College
- Western Wyoming Community College
  - Archeological Services
- University of Wyoming
  - Trustees
  - Geology Museum
  - Department of Rangeland Ecology
  - Department of Geology and Geophysics

Media

Casper, Wyoming

- Casper Newspapers
  Casper Star Tribune

Evanston, Wyoming

- Evanston Radio
  KOTB/KEVA

Jackson, Wyoming

- Jackson Newspaper
  Jackson Hole News & Guide
- Jackson Radio
  KMTN/KJAX
  KSGT
  KZJH
- Jackson TV
  Cable TV
  KJWY (NBC2)

Kemmerer, Wyoming

- Kemmerer Newspaper
  Kemmerer Gazette
  The Little Chicago Review
- Kemmerer Radio
  KMTN/KJAX
- Kemmerer TV
  KJWY
  KMER/KAOX/KDWY

Pinedale, Wyoming

- Pinedale Newspaper
  Pinedale Roundup
  Sublette Examiner
- Pinedale Radio
  KPIN
  KOTB/KEVA

Riverton, Wyoming

- Riverton Newspaper
  Riverton Ranger
- Riverton Radio
  KVOW/KTAK

Rock Springs, Wyoming

- Rock Springs Newspaper
  Daily Rocket-Miner
- Rock Springs Radio
  KRKK/KSIT/KWSQ
  KYCS

Salt Lake City, Utah
- Salt Lake TV
  KUTB-2 CBS

Statewide Newspapers
- *Silver Star Independent*
- *Green River Star*

Statewide Radio
- University of Wyoming
- KVOW
- KTAK

Uinta, Wyoming
- Uinta Newspaper
  Uinta County Herald

Wire Services
- Cheyenne Associated Press
- Denver Associate Press

SECTION 7 CONSULTATION LETTERS

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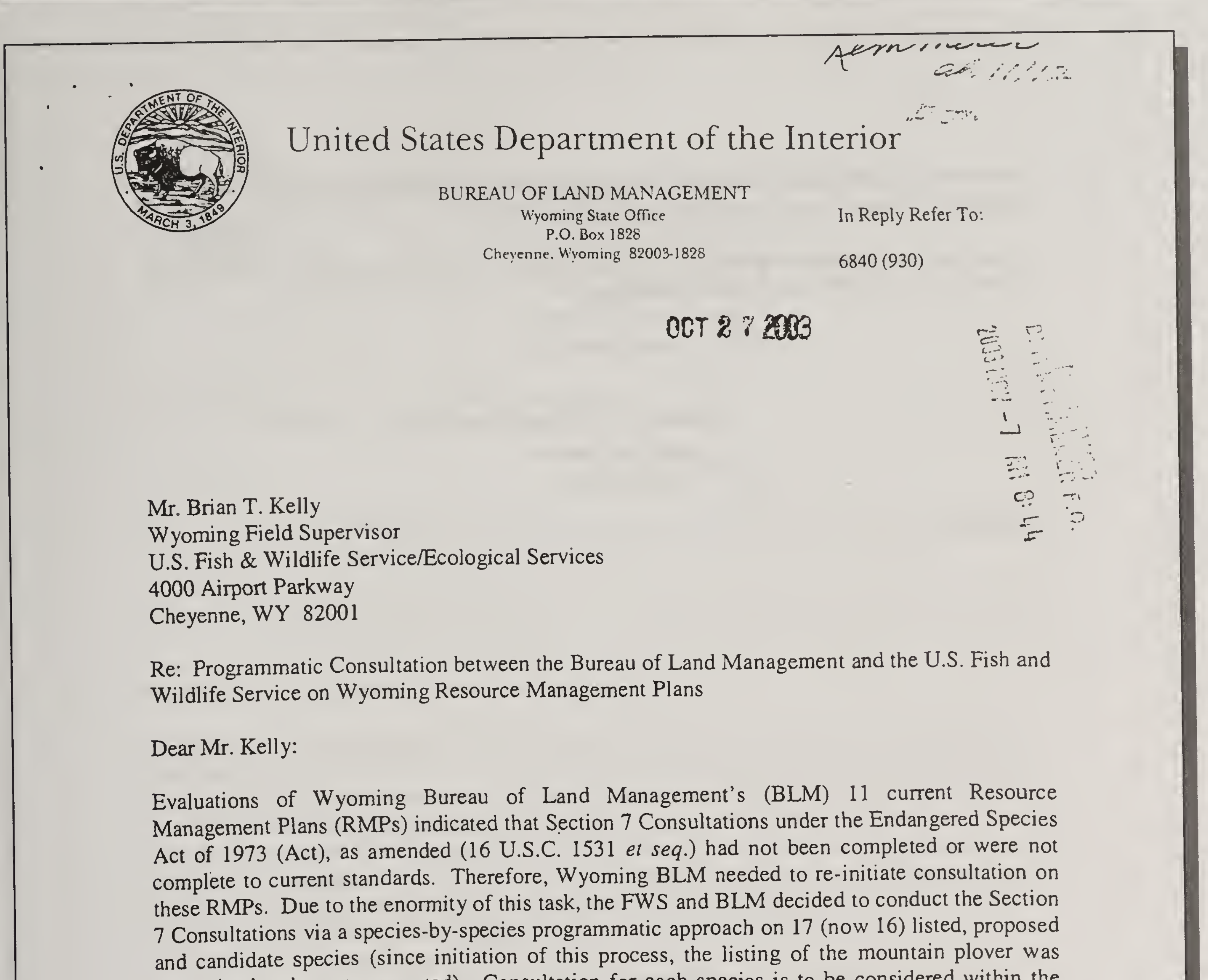

Kemmerer

[illegible]

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Wyoming State Office
P.O. Box 1828
Cheyenne, Wyoming 82003-1828

In Reply Refer To:

6840 (930)

OCT 27 2003

KEMMERER F.O.
2003 NOV -7 AM 8:44

Mr. Brian T. Kelly
Wyoming Field Supervisor
U.S. Fish & Wildlife Service/Ecological Services
4000 Airport Parkway
Cheyenne, WY 82001

Re: Programmatic Consultation between the Bureau of Land Management and the U.S. Fish and Wildlife Service on Wyoming Resource Management Plans

Dear Mr. Kelly:

Evaluations of Wyoming Bureau of Land Management's (BLM) 11 current Resource Management Plans (RMPs) indicated that Section 7 Consultations under the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*) had not been completed or were not complete to current standards. Therefore, Wyoming BLM needed to re-initiate consultation on these RMPs. Due to the enormity of this task, the FWS and BLM decided to conduct the Section 7 Consultations via a species-by-species programmatic approach on 17 (now 16) listed, proposed and candidate species (since initiation of this process, the listing of the mountain plover was determined to be not warranted). Consultation for each species is to be considered within the boundary of the State of Wyoming and activities approved by the BLM analyzed for each respective RMP.

This process is consistent with the August 30, 2000, Memorandum of Agreement (MOA), signed by the BLM, U.S. Fish and Wildlife Service, USDA Forest Service and National Marine Fisheries Service. That MOA committed the signatory agencies to work closer to improve the interagency consultation process under the Endangered Species Act (Act) – in effect to streamline the process and to work together cooperatively. The attached process is an excellent example of the premises of the MOA, and the cooperative and effective way our two agencies can work together.

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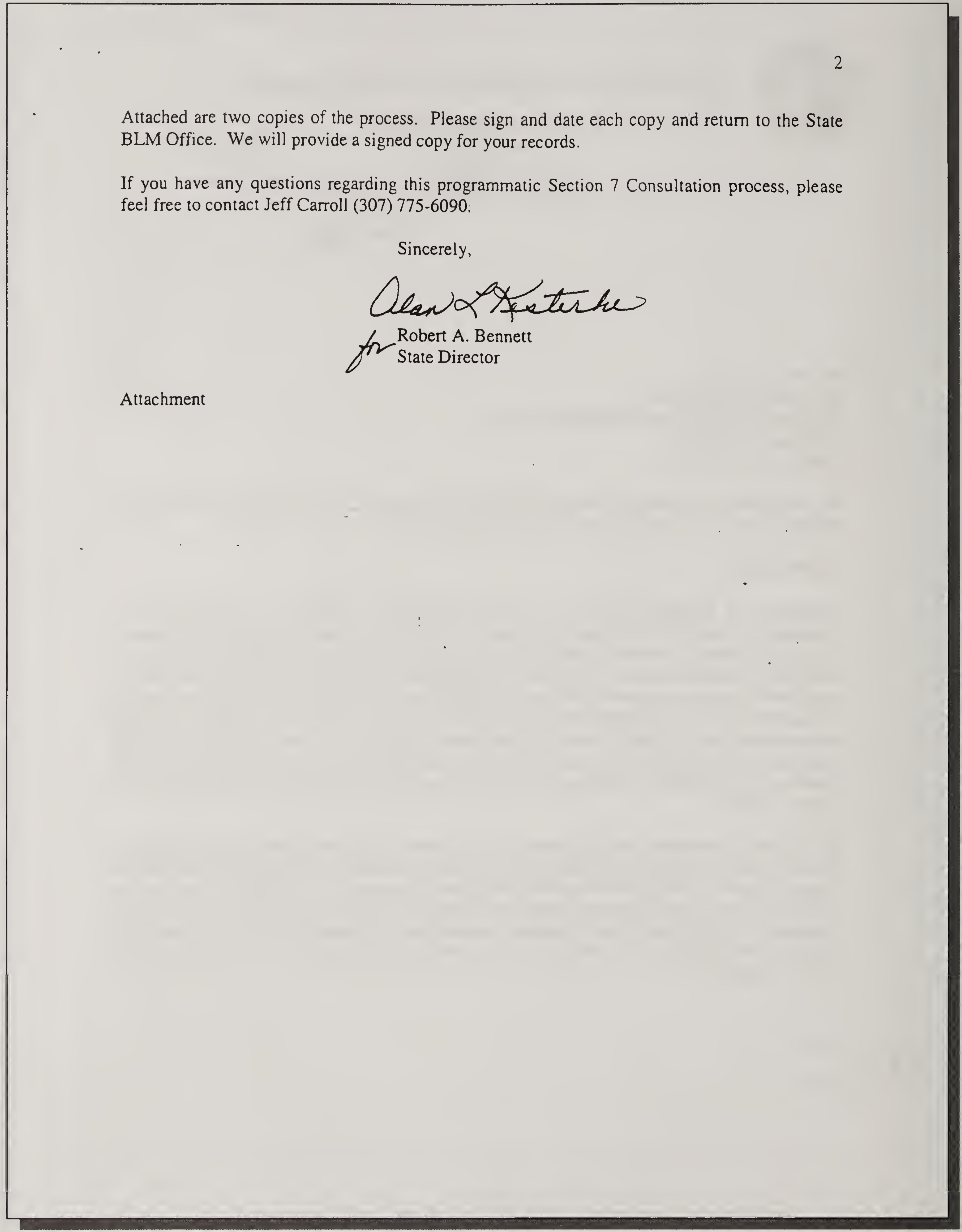


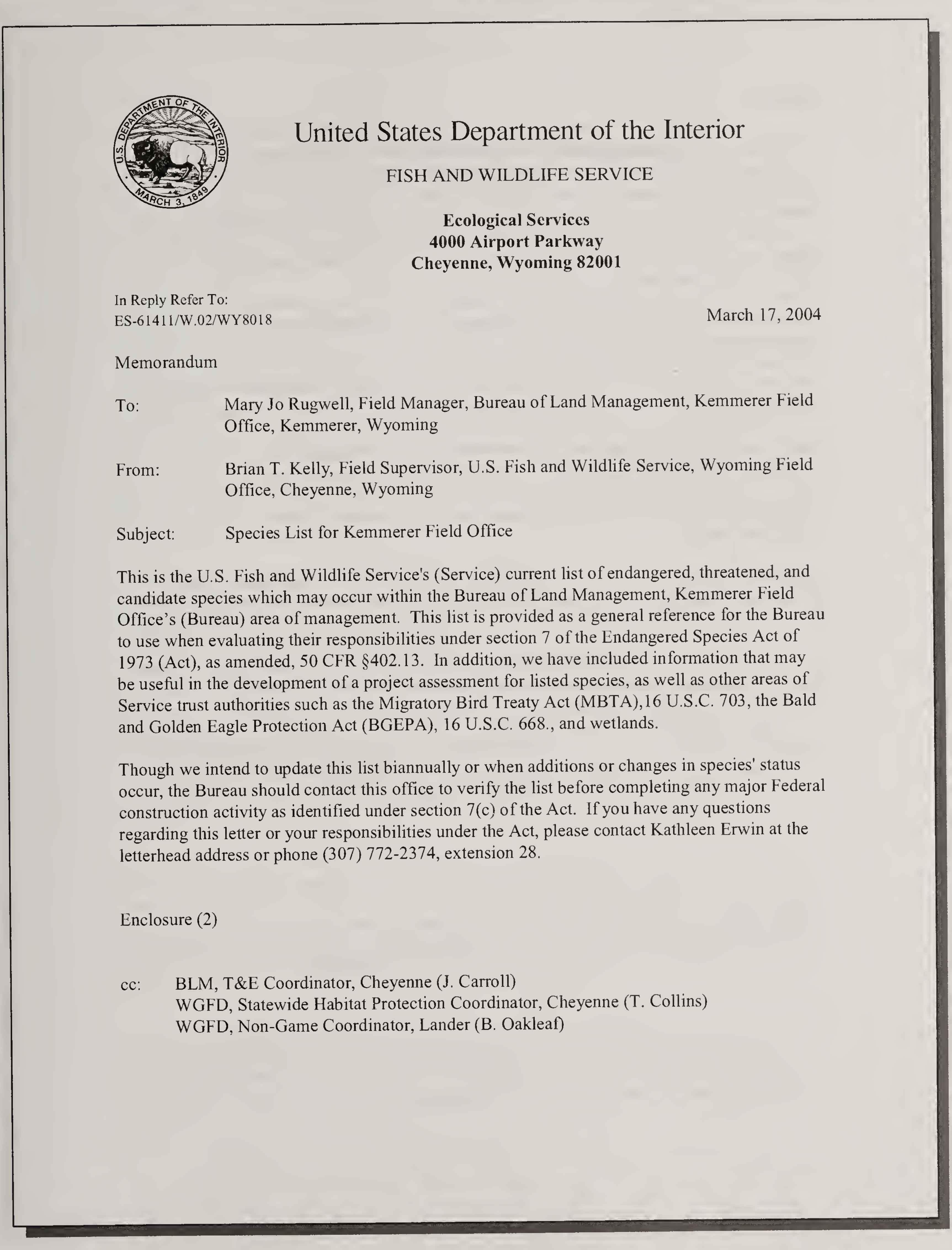
Attached are two copies of the process. Please sign and date each copy and return to the State BLM Office. We will provide a signed copy for your records.

If you have any questions regarding this programmatic Section 7 Consultation process, please feel free to contact Jeff Carroll (307) 775-6090.

Sincerely,

Alan L Kesterke
for Robert A. Bennett
State Director

Attachment



MARCH 3, 1849

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4000 Airport Parkway
Cheyenne, Wyoming 82001

In Reply Refer To:
ES-61411/W.02/WY8018

March 17, 2004

Memorandum

To: Mary Jo Rugwell, Field Manager, Bureau of Land Management, Kemmerer Field Office, Kemmerer, Wyoming

From: Brian T. Kelly, Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office, Cheyenne, Wyoming

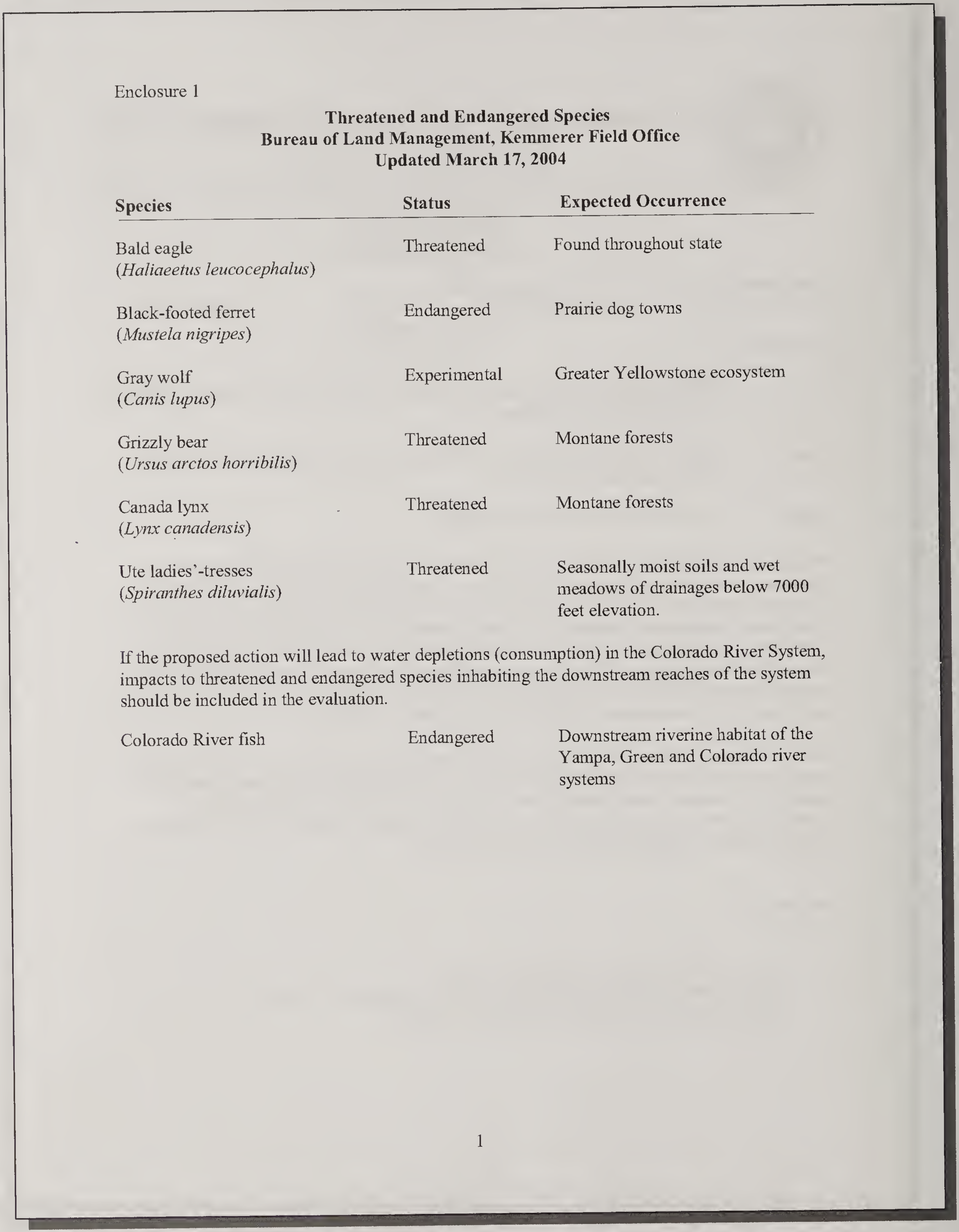
Subject: Species List for Kemmerer Field Office

This is the U.S. Fish and Wildlife Service's (Service) current list of endangered, threatened, and candidate species which may occur within the Bureau of Land Management, Kemmerer Field Office's (Bureau) area of management. This list is provided as a general reference for the Bureau to use when evaluating their responsibilities under section 7 of the Endangered Species Act of 1973 (Act), as amended, 50 CFR §402.13. In addition, we have included information that may be useful in the development of a project assessment for listed species, as well as other areas of Service trust authorities such as the Migratory Bird Treaty Act (MBTA),16 U.S.C. 703, the Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668., and wetlands.

Though we intend to update this list biannually or when additions or changes in species' status occur, the Bureau should contact this office to verify the list before completing any major Federal construction activity as identified under section 7(c) of the Act. If you have any questions regarding this letter or your responsibilities under the Act, please contact Kathleen Erwin at the letterhead address or phone (307) 772-2374, extension 28.

Enclosure (2)

cc: BLM, T&E Coordinator, Cheyenne (J. Carroll)
WGFD, Statewide Habitat Protection Coordinator, Cheyenne (T. Collins)
WGFD, Non-Game Coordinator, Lander (B. Oakleaf)



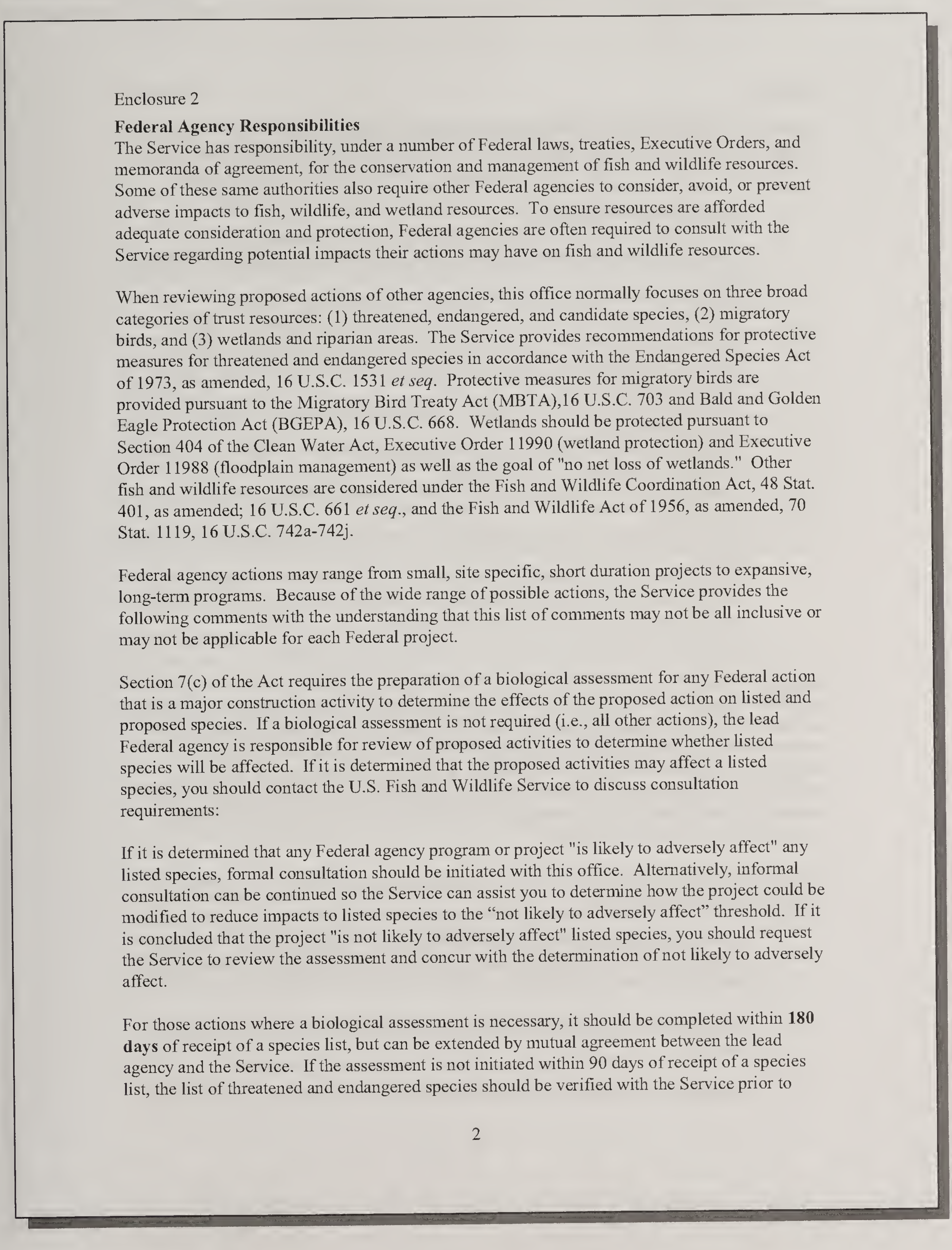
Enclosure 1

Threatened and Endangered Species
Bureau of Land Management, Kemmerer Field Office
Updated March 17, 2004

Species	Status	Expected Occurrence
Bald eagle (*Haliaeetus leucocephalus*)	Threatened	Found throughout state
Black-footed ferret (*Mustela nigripes*)	Endangered	Prairie dog towns
Gray wolf (*Canis lupus*)	Experimental	Greater Yellowstone ecosystem
Grizzly bear (*Ursus arctos horribilis*)	Threatened	Montane forests
Canada lynx (*Lynx canadensis*)	Threatened	Montane forests
Ute ladies'-tresses (*Spiranthes diluvialis*)	Threatened	Seasonally moist soils and wet meadows of drainages below 7000 feet elevation.

If the proposed action will lead to water depletions (consumption) in the Colorado River System, impacts to threatened and endangered species inhabiting the downstream reaches of the system should be included in the evaluation.

Colorado River fish	Endangered	Downstream riverine habitat of the Yampa, Green and Colorado river systems



Enclosure 2

Federal Agency Responsibilities
The Service has responsibility, under a number of Federal laws, treaties, Executive Orders, and memoranda of agreement, for the conservation and management of fish and wildlife resources. Some of these same authorities also require other Federal agencies to consider, avoid, or prevent adverse impacts to fish, wildlife, and wetland resources. To ensure resources are afforded adequate consideration and protection, Federal agencies are often required to consult with the Service regarding potential impacts their actions may have on fish and wildlife resources.

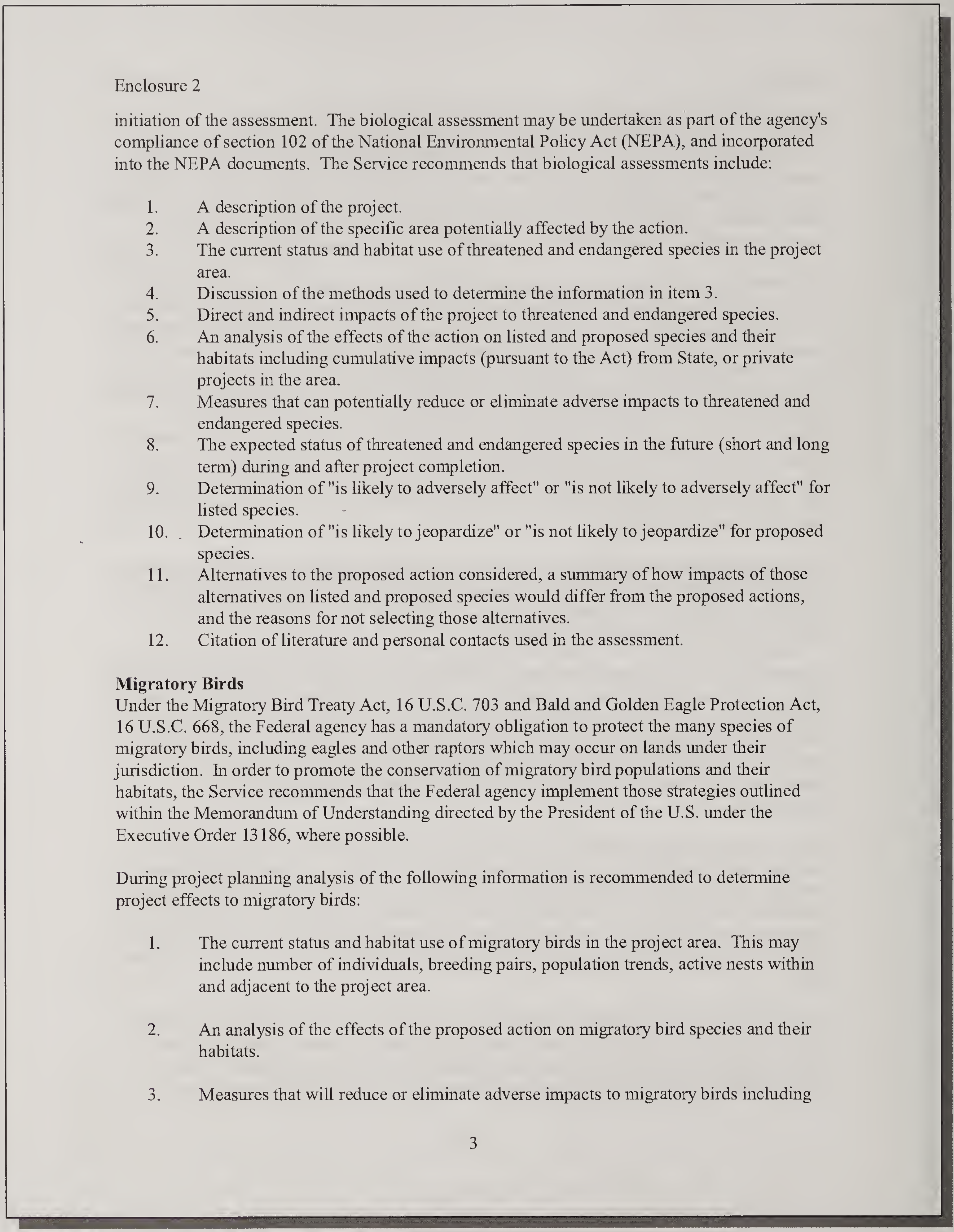
When reviewing proposed actions of other agencies, this office normally focuses on three broad categories of trust resources: (1) threatened, endangered, and candidate species, (2) migratory birds, and (3) wetlands and riparian areas. The Service provides recommendations for protective measures for threatened and endangered species in accordance with the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 *et seq.* Protective measures for migratory birds are provided pursuant to the Migratory Bird Treaty Act (MBTA),16 U.S.C. 703 and Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668. Wetlands should be protected pursuant to Section 404 of the Clean Water Act, Executive Order 11990 (wetland protection) and Executive Order 11988 (floodplain management) as well as the goal of "no net loss of wetlands." Other fish and wildlife resources are considered under the Fish and Wildlife Coordination Act, 48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*, and the Fish and Wildlife Act of 1956, as amended, 70 Stat. 1119, 16 U.S.C. 742a-742j.

Federal agency actions may range from small, site specific, short duration projects to expansive, long-term programs. Because of the wide range of possible actions, the Service provides the following comments with the understanding that this list of comments may not be all inclusive or may not be applicable for each Federal project.

Section 7(c) of the Act requires the preparation of a biological assessment for any Federal action that is a major construction activity to determine the effects of the proposed action on listed and proposed species. If a biological assessment is not required (i.e., all other actions), the lead Federal agency is responsible for review of proposed activities to determine whether listed species will be affected. If it is determined that the proposed activities may affect a listed species, you should contact the U.S. Fish and Wildlife Service to discuss consultation requirements:

If it is determined that any Federal agency program or project "is likely to adversely affect" any listed species, formal consultation should be initiated with this office. Alternatively, informal consultation can be continued so the Service can assist you to determine how the project could be modified to reduce impacts to listed species to the "not likely to adversely affect" threshold. If it is concluded that the project "is not likely to adversely affect" listed species, you should request the Service to review the assessment and concur with the determination of not likely to adversely affect.

For those actions where a biological assessment is necessary, it should be completed within **180 days** of receipt of a species list, but can be extended by mutual agreement between the lead agency and the Service. If the assessment is not initiated within 90 days of receipt of a species list, the list of threatened and endangered species should be verified with the Service prior to



initiation of the assessment. The biological assessment may be undertaken as part of the agency's compliance of section 102 of the National Environmental Policy Act (NEPA), and incorporated into the NEPA documents. The Service recommends that biological assessments include:

1. A description of the project.
2. A description of the specific area potentially affected by the action.
3. The current status and habitat use of threatened and endangered species in the project area.
4. Discussion of the methods used to determine the information in item 3.
5. Direct and indirect impacts of the project to threatened and endangered species.
6. An analysis of the effects of the action on listed and proposed species and their habitats including cumulative impacts (pursuant to the Act) from State, or private projects in the area.
7. Measures that can potentially reduce or eliminate adverse impacts to threatened and endangered species.
8. The expected status of threatened and endangered species in the future (short and long term) during and after project completion.
9. Determination of "is likely to adversely affect" or "is not likely to adversely affect" for listed species.
10. Determination of "is likely to jeopardize" or "is not likely to jeopardize" for proposed species.
11. Alternatives to the proposed action considered, a summary of how impacts of those alternatives on listed and proposed species would differ from the proposed actions, and the reasons for not selecting those alternatives.
12. Citation of literature and personal contacts used in the assessment.

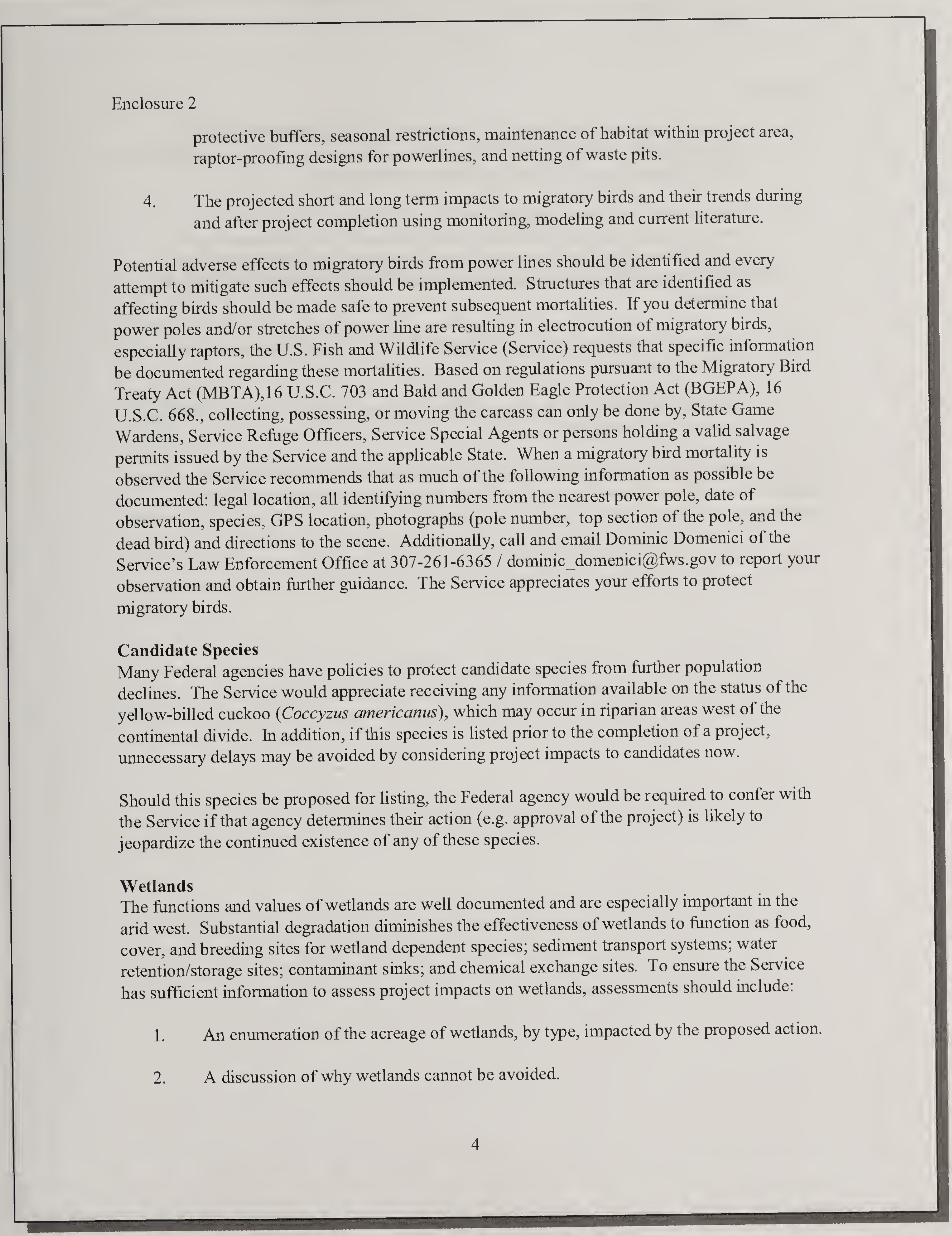
Migratory Birds
Under the Migratory Bird Treaty Act, 16 U.S.C. 703 and Bald and Golden Eagle Protection Act, 16 U.S.C. 668, the Federal agency has a mandatory obligation to protect the many species of migratory birds, including eagles and other raptors which may occur on lands under their jurisdiction. In order to promote the conservation of migratory bird populations and their habitats, the Service recommends that the Federal agency implement those strategies outlined within the Memorandum of Understanding directed by the President of the U.S. under the Executive Order 13186, where possible.

During project planning analysis of the following information is recommended to determine project effects to migratory birds:

1. The current status and habitat use of migratory birds in the project area. This may include number of individuals, breeding pairs, population trends, active nests within and adjacent to the project area.

2. An analysis of the effects of the proposed action on migratory bird species and their habitats.

3. Measures that will reduce or eliminate adverse impacts to migratory birds including



protective buffers, seasonal restrictions, maintenance of habitat within project area, raptor-proofing designs for powerlines, and netting of waste pits.

4. The projected short and long term impacts to migratory birds and their trends during and after project completion using monitoring, modeling and current literature.

Potential adverse effects to migratory birds from power lines should be identified and every attempt to mitigate such effects should be implemented. Structures that are identified as affecting birds should be made safe to prevent subsequent mortalities. If you determine that power poles and/or stretches of power line are resulting in electrocution of migratory birds, especially raptors, the U.S. Fish and Wildlife Service (Service) requests that specific information be documented regarding these mortalities. Based on regulations pursuant to the Migratory Bird Treaty Act (MBTA),16 U.S.C. 703 and Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668., collecting, possessing, or moving the carcass can only be done by, State Game Wardens, Service Refuge Officers, Service Special Agents or persons holding a valid salvage permits issued by the Service and the applicable State. When a migratory bird mortality is observed the Service recommends that as much of the following information as possible be documented: legal location, all identifying numbers from the nearest power pole, date of observation, species, GPS location, photographs (pole number, top section of the pole, and the dead bird) and directions to the scene. Additionally, call and email Dominic Domenici of the Service's Law Enforcement Office at 307-261-6365 / dominic_domenici@fws.gov to report your observation and obtain further guidance. The Service appreciates your efforts to protect migratory birds.

Candidate Species

Many Federal agencies have policies to protect candidate species from further population declines. The Service would appreciate receiving any information available on the status of the yellow-billed cuckoo (*Coccyzus americanus*), which may occur in riparian areas west of the continental divide. In addition, if this species is listed prior to the completion of a project, unnecessary delays may be avoided by considering project impacts to candidates now.

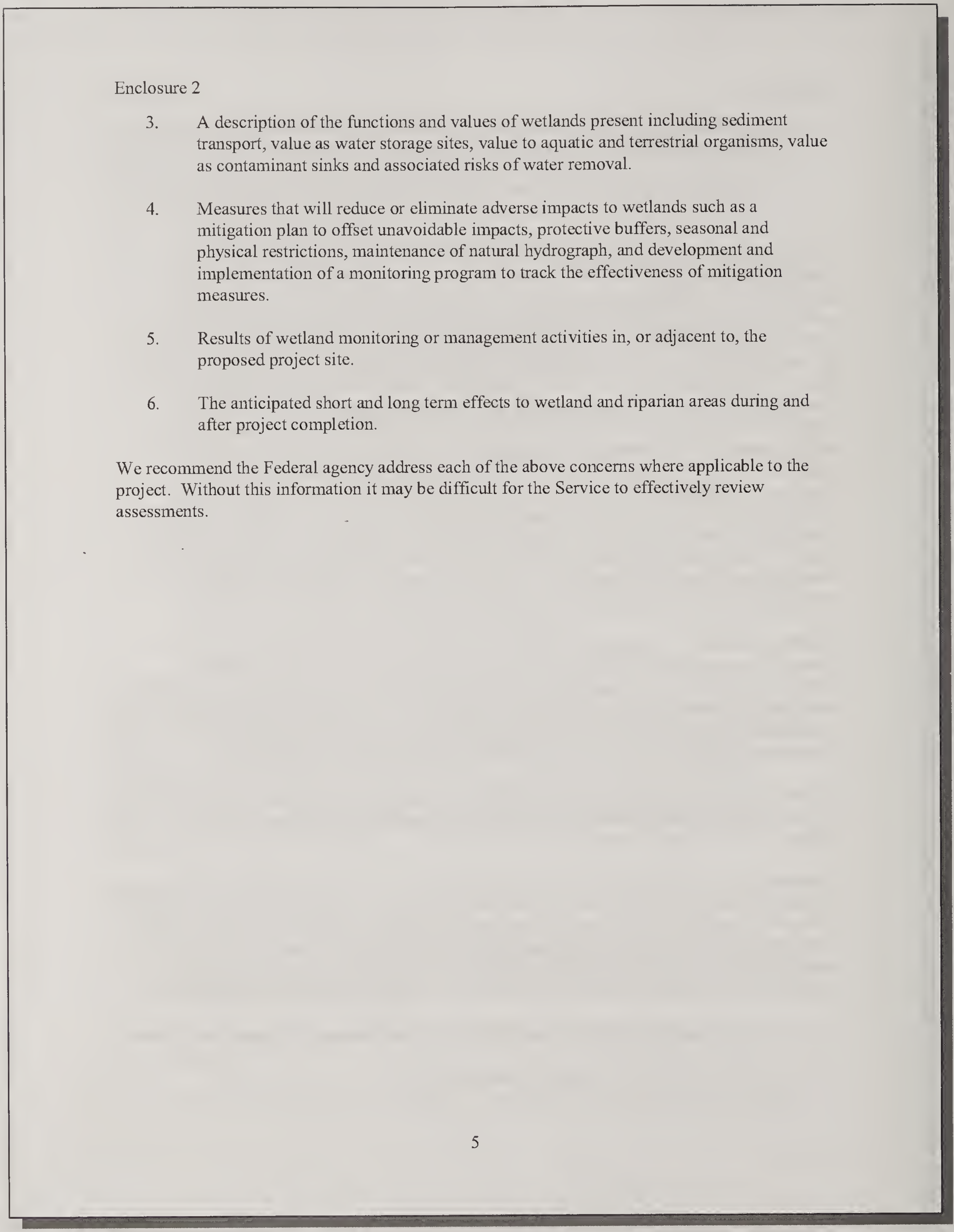
Should this species be proposed for listing, the Federal agency would be required to confer with the Service if that agency determines their action (e.g. approval of the project) is likely to jeopardize the continued existence of any of these species.

Wetlands

The functions and values of wetlands are well documented and are especially important in the arid west. Substantial degradation diminishes the effectiveness of wetlands to function as food, cover, and breeding sites for wetland dependent species; sediment transport systems; water retention/storage sites; contaminant sinks; and chemical exchange sites. To ensure the Service has sufficient information to assess project impacts on wetlands, assessments should include:

1. An enumeration of the acreage of wetlands, by type, impacted by the proposed action.

2. A discussion of why wetlands cannot be avoided.



Enclosure 2

3. A description of the functions and values of wetlands present including sediment transport, value as water storage sites, value to aquatic and terrestrial organisms, value as contaminant sinks and associated risks of water removal.

4. Measures that will reduce or eliminate adverse impacts to wetlands such as a mitigation plan to offset unavoidable impacts, protective buffers, seasonal and physical restrictions, maintenance of natural hydrograph, and development and implementation of a monitoring program to track the effectiveness of mitigation measures.

5. Results of wetland monitoring or management activities in, or adjacent to, the proposed project site.

6. The anticipated short and long term effects to wetland and riparian areas during and after project completion.

We recommend the Federal agency address each of the above concerns where applicable to the project. Without this information it may be difficult for the Service to effectively review assessments.

NATIVE AMERICAN CONSULTATION LETTERS

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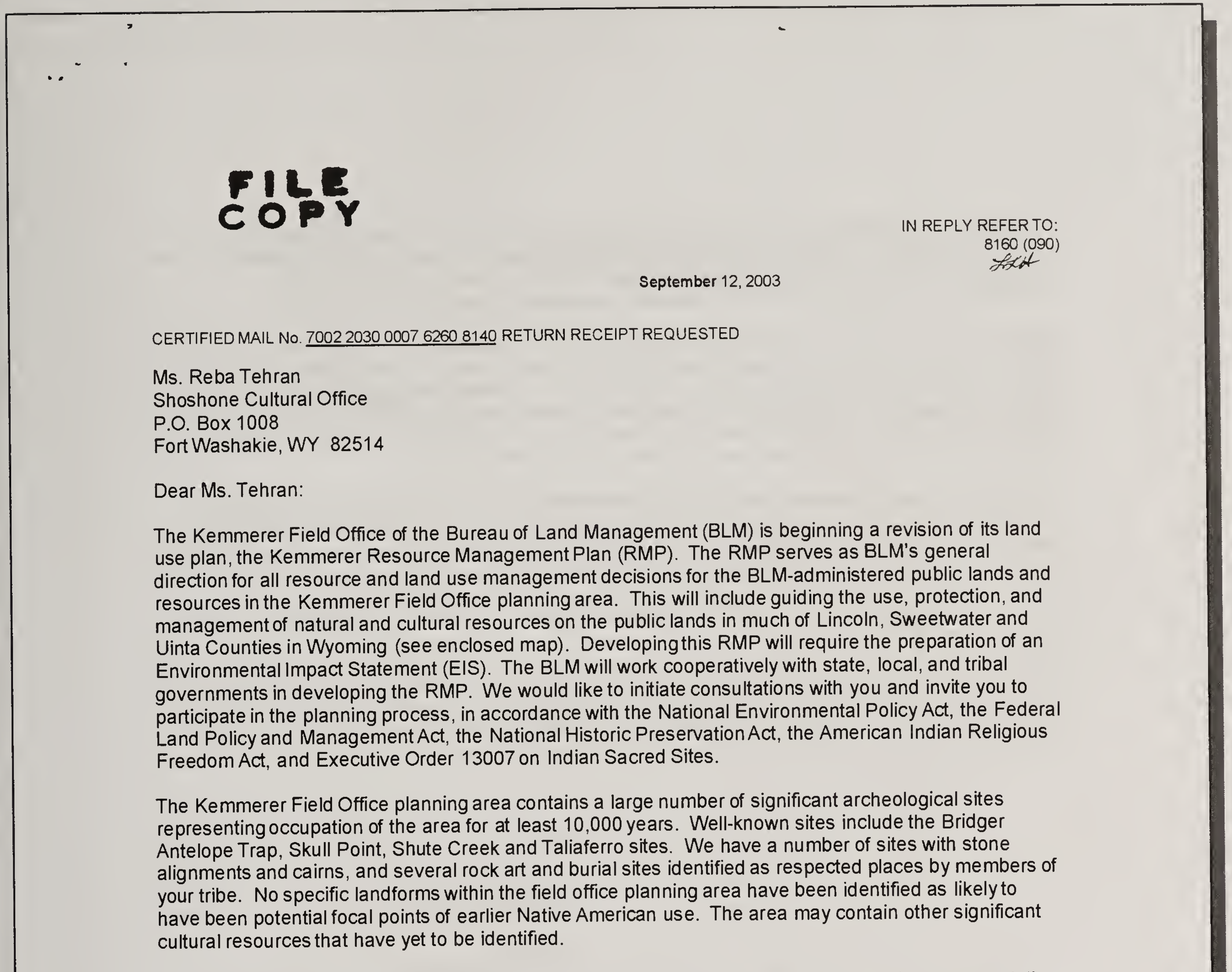


FILE
COPY

IN REPLY REFER TO:
8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8140 RETURN RECEIPT REQUESTED

Ms. Reba Tehran
Shoshone Cultural Office
P.O. Box 1008
Fort Washakie, WY 82514

Dear Ms. Tehran:

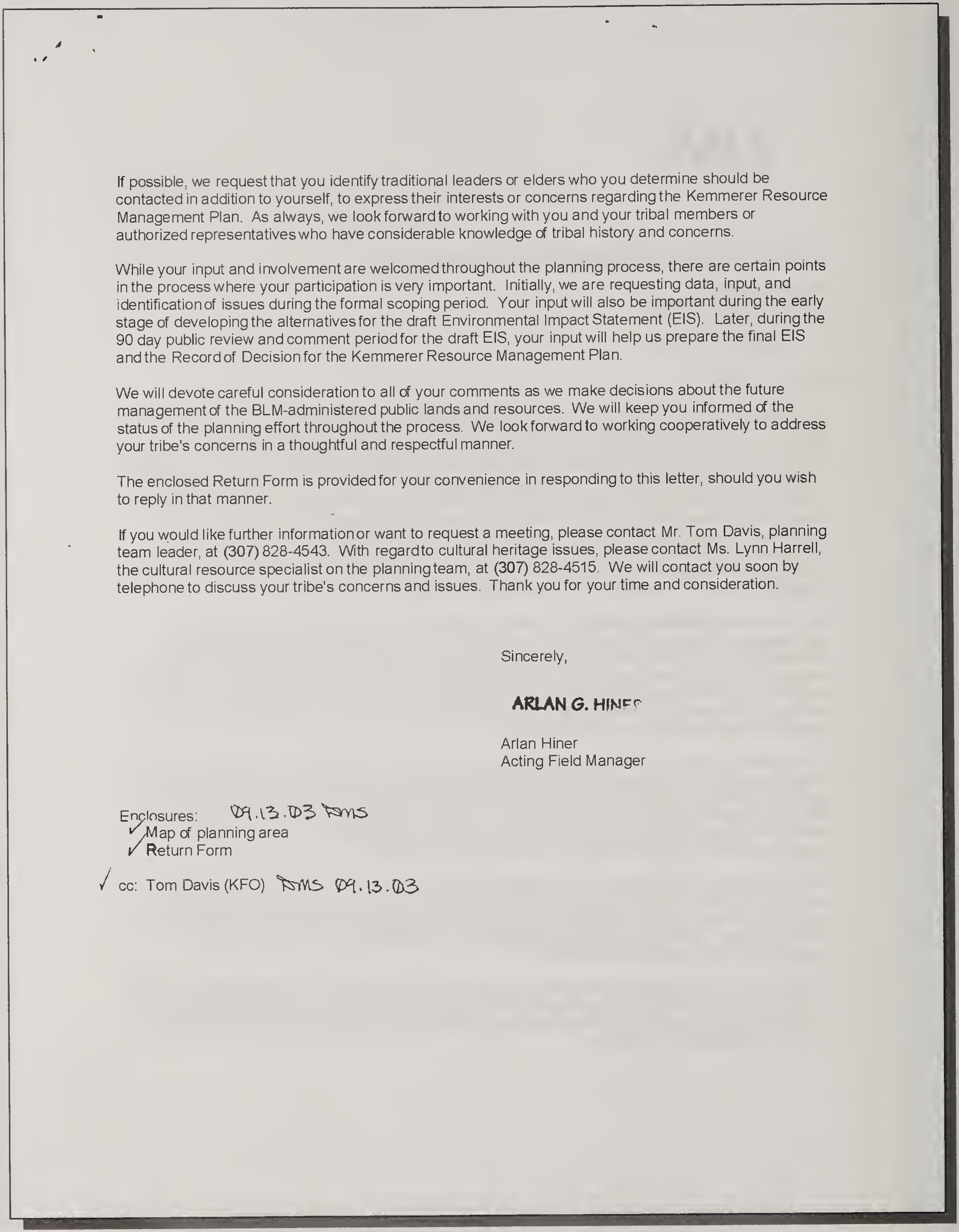
The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its land use plan, the Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Sweetwater and Uinta Counties in Wyoming (see enclosed map). Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP. We would like to initiate consultations with you and invite you to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites.

The Kemmerer Field Office planning area contains a large number of significant archeological sites representing occupation of the area for at least 10,000 years. Well-known sites include the Bridger Antelope Trap, Skull Point, Shute Creek and Taliaferro sites. We have a number of sites with stone alignments and cairns, and several rock art and burial sites identified as respected places by members of your tribe. No specific landforms within the field office planning area have been identified as likely to have been potential focal points of earlier Native American use. The area may contain other significant cultural resources that have yet to be identified.

We are contacting tribes who have oral traditions or have previously expressed cultural concerns relating to the planning area, or who are documented to have occupied or used the area during historic times. We request your comments on any issues or concerns regarding the management of this planning area. We would appreciate any historical information on the use and significance of the planning area, such as places of traditional, religious, or cultural importance that your tribe wishes the BLM to consider in determining tribal needs for use, access, or other special management.

The Kemmerer Field Office requests a consultation with your tribe at a time and location convenient for you. We would like to discuss the Kemmerer RMP revision and why your involvement is vital to the success of this revision. We would also like to receive any information or concerns you may have about the RMP revision. We would be pleased to offer tours of the planning area, including significant archeological sites or other areas of interest.

In addition to our consultation request, we will be conducting a formal public involvement process during the next six months, including public scoping meetings in November of 2003. We would be very pleased if you participate in this process. We will send you invitations to participate in this process, including specific meeting dates and locations.



If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer Resource Management Plan. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

While your input and involvement are welcomed throughout the planning process, there are certain points in the process where your participation is very important. Initially, we are requesting data, input, and identification of issues during the formal scoping period. Your input will also be important during the early stage of developing the alternatives for the draft Environmental Impact Statement (EIS). Later, during the 90 day public review and comment period for the draft EIS, your input will help us prepare the final EIS and the Record of Decision for the Kemmerer Resource Management Plan.

We will devote careful consideration to all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively to address your tribe's concerns in a thoughtful and respectful manner.

The enclosed Return Form is provided for your convenience in responding to this letter, should you wish to reply in that manner.

If you would like further information or want to request a meeting, please contact Mr. Tom Davis, planning team leader, at (307) 828-4543. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

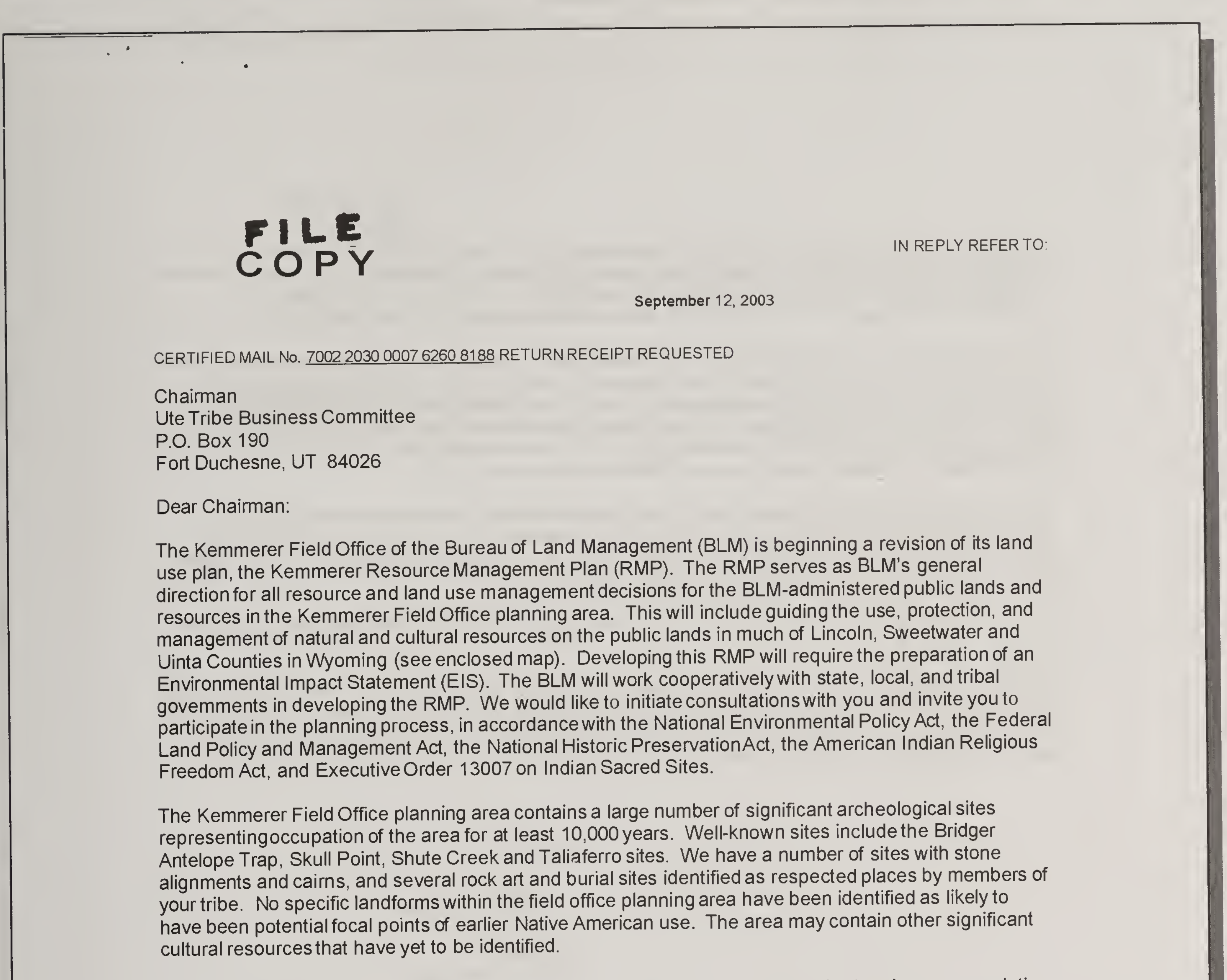
Sincerely,

ARLAN G. HINER

Arlan Hiner
Acting Field Manager

Enclosures: 09.13.03 DMS
✓ Map of planning area
✓ Return Form

✓ cc: Tom Davis (KFO) DMS 09.13.03



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COPY

IN REPLY REFER TO:

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8188 RETURN RECEIPT REQUESTED

Chairman
Ute Tribe Business Committee
P.O. Box 190
Fort Duchesne, UT 84026

Dear Chairman:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its land use plan, the Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Sweetwater and Uinta Counties in Wyoming (see enclosed map). Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP. We would like to initiate consultations with you and invite you to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites.

The Kemmerer Field Office planning area contains a large number of significant archeological sites representing occupation of the area for at least 10,000 years. Well-known sites include the Bridger Antelope Trap, Skull Point, Shute Creek and Taliaferro sites. We have a number of sites with stone alignments and cairns, and several rock art and burial sites identified as respected places by members of your tribe. No specific landforms within the field office planning area have been identified as likely to have been potential focal points of earlier Native American use. The area may contain other significant cultural resources that have yet to be identified.

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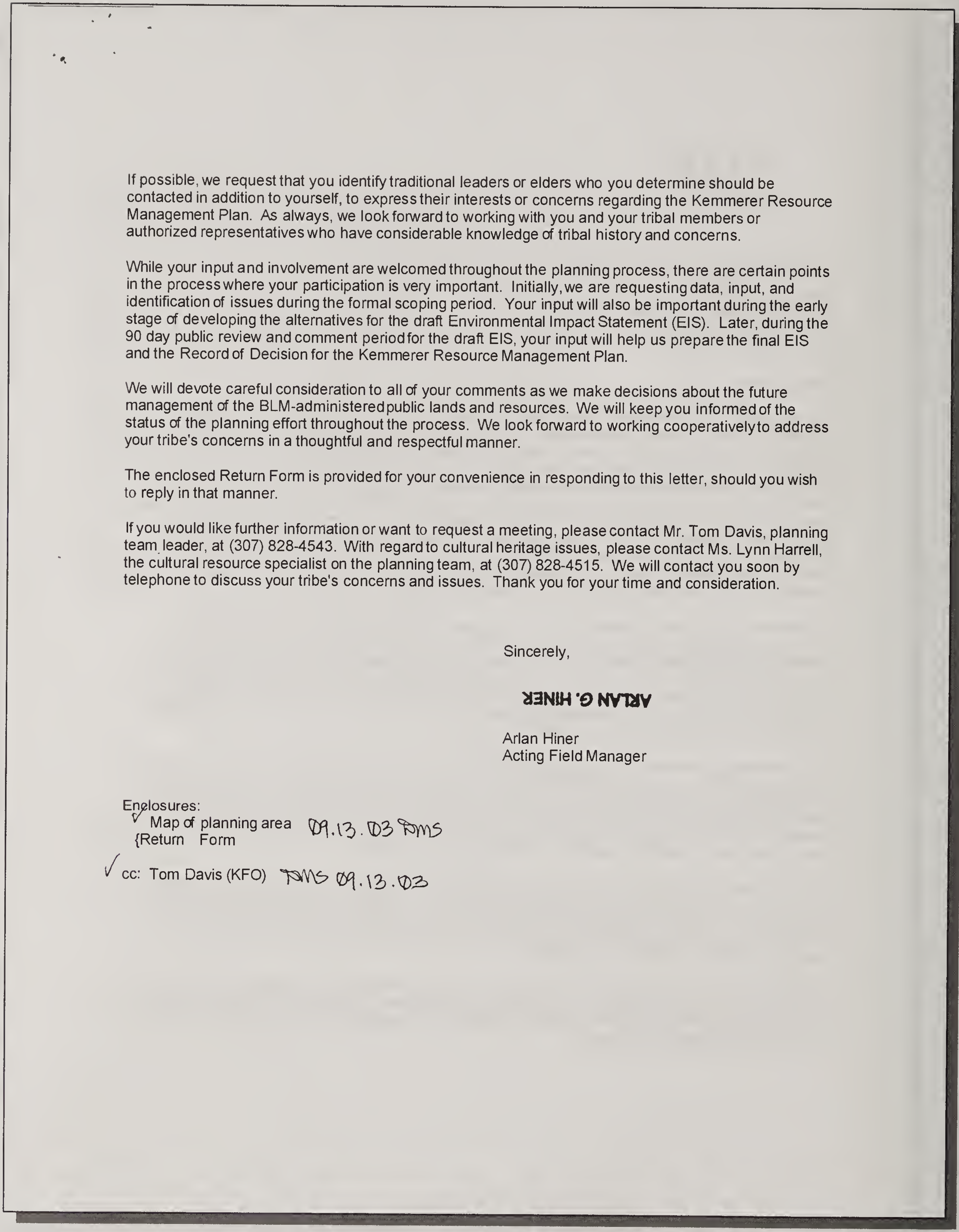
The Kemmerer Field Office requests a consultation with your tribe at a time and location convenient for you. We would like to discuss the Kemmerer RMP revision and why your involvement is vital to the success of this revision. We would also like to receive any information or concerns you may have about the RMP revision. We would be pleased to offer tours of the planning area, including significant archeological sites or other areas of interest.

In addition to our consultation request, we will be conducting a formal public involvement process during the next six months, including public scoping meetings in November of 2003. We would be very pleased if you participate in this process. We will send you invitations to participate in this process, including specific meeting dates and locations.



If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer Resource Management Plan. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

While your input and involvement are welcomed throughout the planning process, there are certain points in the process where your participation is very important. Initially, we are requesting data, input, and identification of issues during the formal scoping period. Your input will also be important during the early stage of developing the alternatives for the draft Environmental Impact Statement (EIS). Later, during the 90 day public review and comment period for the draft EIS, your input will help us prepare the final EIS and the Record of Decision for the Kemmerer Resource Management Plan.

We will devote careful consideration to all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively to address your tribe's concerns in a thoughtful and respectful manner.

The enclosed Return Form is provided for your convenience in responding to this letter, should you wish to reply in that manner.

If you would like further information or want to request a meeting, please contact Mr. Tom Davis, planning team leader, at (307) 828-4543. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

Sincerely,

ARLAN G. HINER

Arlan Hiner
Acting Field Manager

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{Return Form

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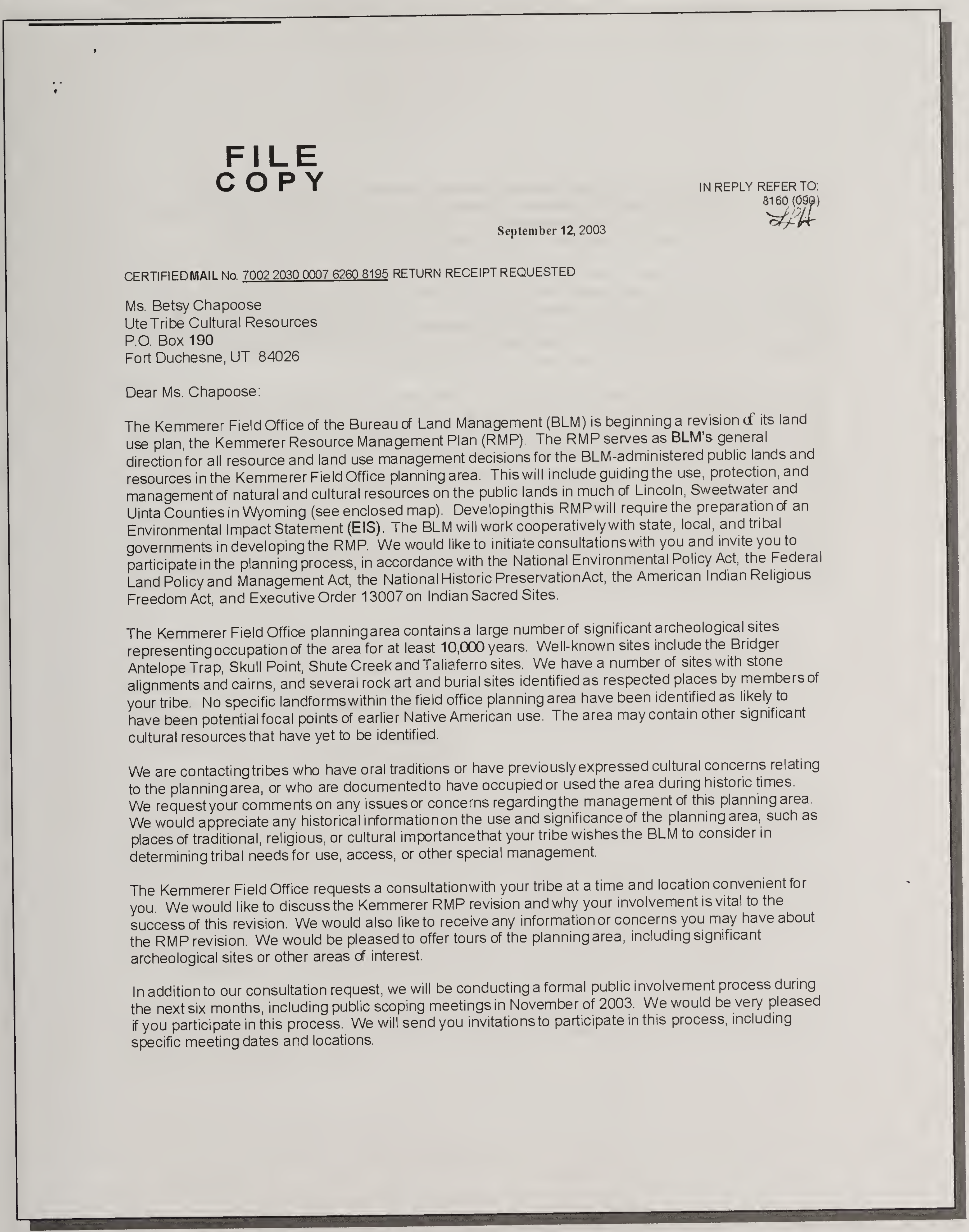

FILE COPY

IN REPLY REFER TO:
8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8195 RETURN RECEIPT REQUESTED

Ms. Betsy Chapoose
Ute Tribe Cultural Resources
P.O. Box 190
Fort Duchesne, UT 84026

Dear Ms. Chapoose:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its land use plan, the Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Sweetwater and Uinta Counties in Wyoming (see enclosed map). Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP. We would like to initiate consultations with you and invite you to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites.

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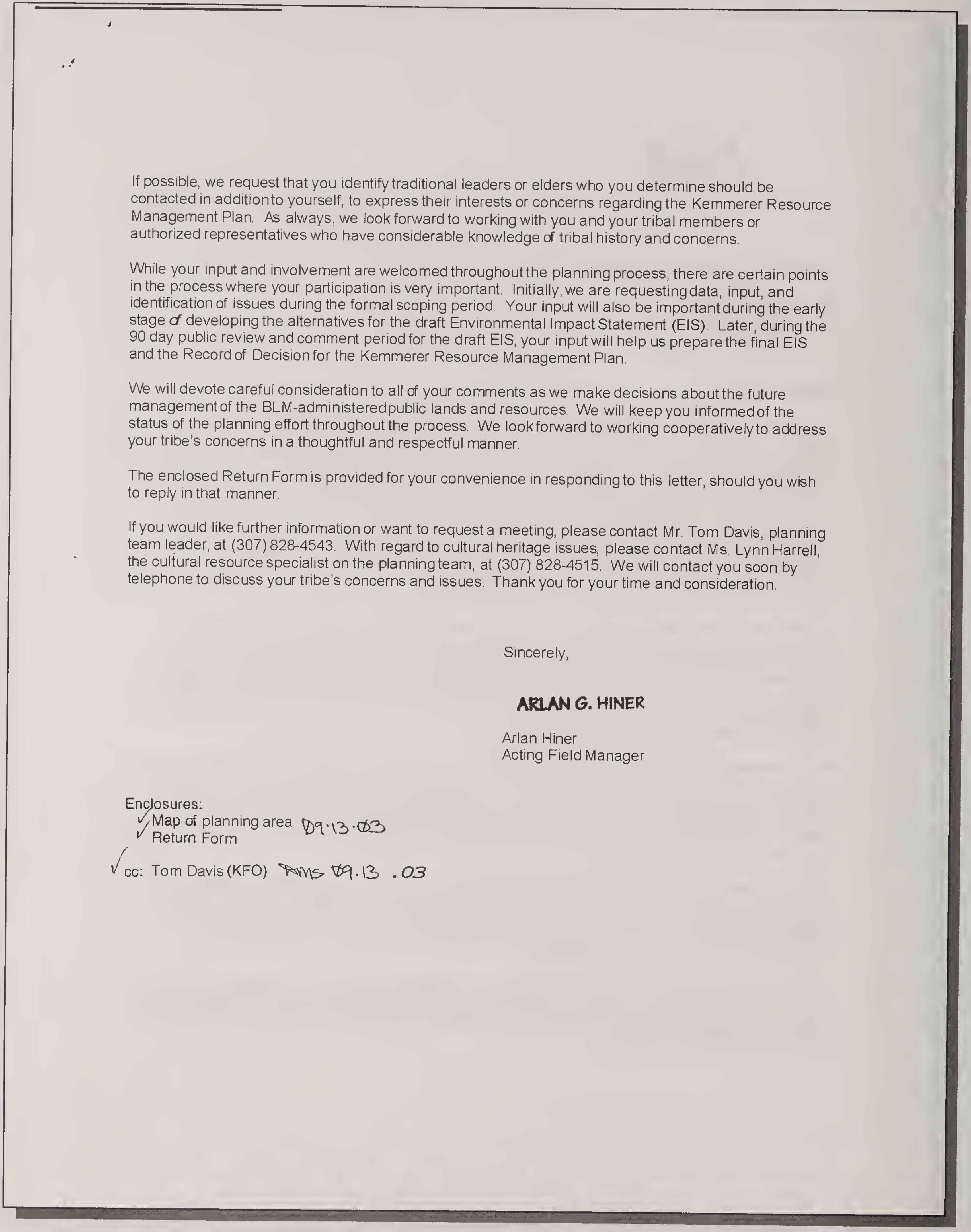
The Kemmerer Field Office requests a consultation with your tribe at a time and location convenient for you. We would like to discuss the Kemmerer RMP revision and why your involvement is vital to the success of this revision. We would also like to receive any information or concerns you may have about the RMP revision. We would be pleased to offer tours of the planning area, including significant archeological sites or other areas of interest.

In addition to our consultation request, we will be conducting a formal public involvement process during the next six months, including public scoping meetings in November of 2003. We would be very pleased if you participate in this process. We will send you invitations to participate in this process, including specific meeting dates and locations.



If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer Resource Management Plan. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

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We will devote careful consideration to all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively to address your tribe's concerns in a thoughtful and respectful manner.

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If you would like further information or want to request a meeting, please contact Mr. Tom Davis, planning team leader, at (307) 828-4543. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

Sincerely,

ARLAN G. HINER

Arlan Hiner
Acting Field Manager

Enclosures:
✓ Map of planning area 09·13·03
✓ Return Form

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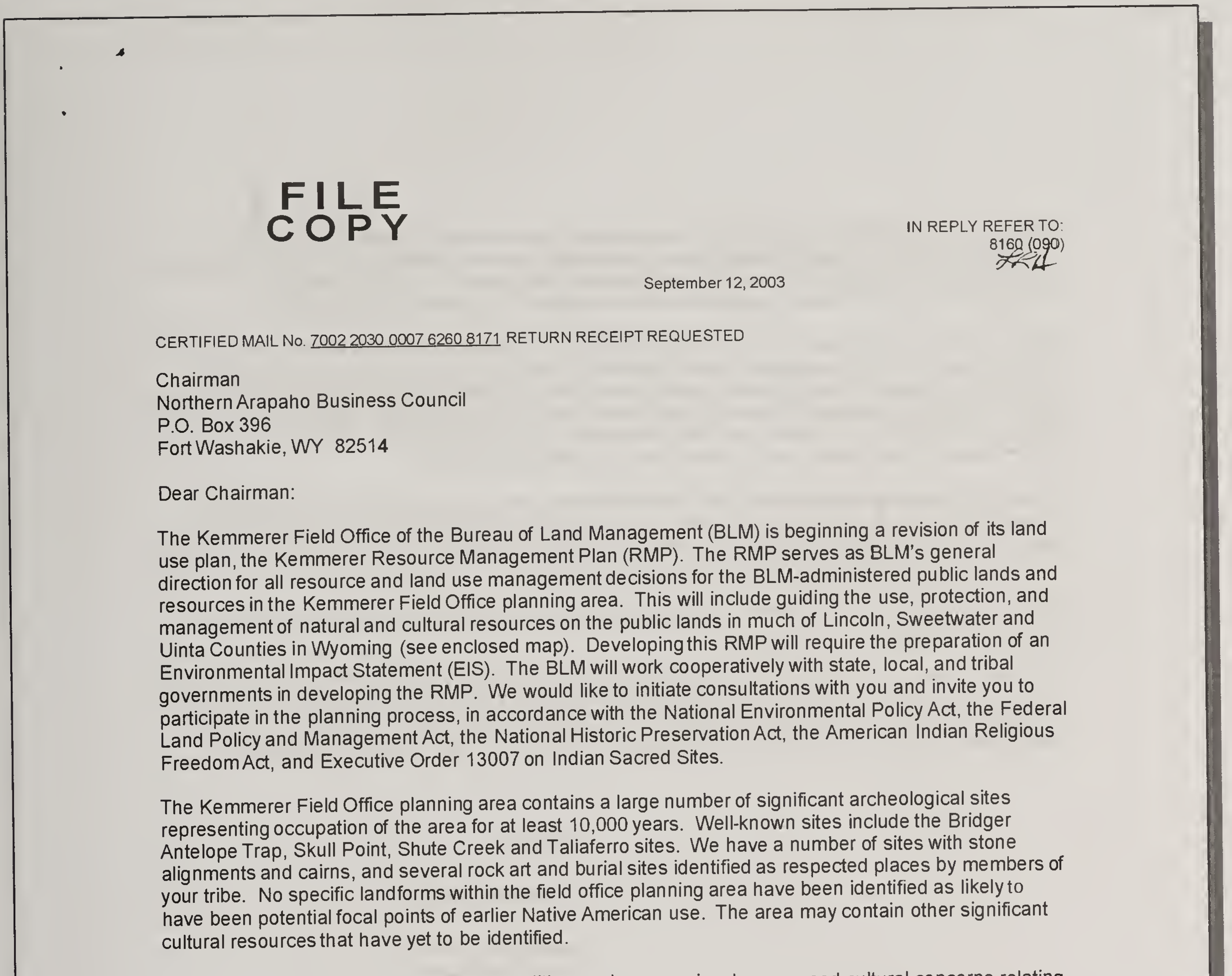

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IN REPLY REFER TO:
8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8171 RETURN RECEIPT REQUESTED

Chairman
Northern Arapaho Business Council
P.O. Box 396
Fort Washakie, WY 82514

Dear Chairman:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its land use plan, the Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Sweetwater and Uinta Counties in Wyoming (see enclosed map). Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP. We would like to initiate consultations with you and invite you to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites.

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The Kemmerer Field Office requests a consultation with your tribe at a time and location convenient for you. We would like to discuss the Kemmerer RMP revision and why your involvement is vital to the success of this revision. We would also like to receive any information or concerns you may have about the RMP revision. We would be pleased to offer tours of the planning area, including significant archeological sites or other areas of interest.

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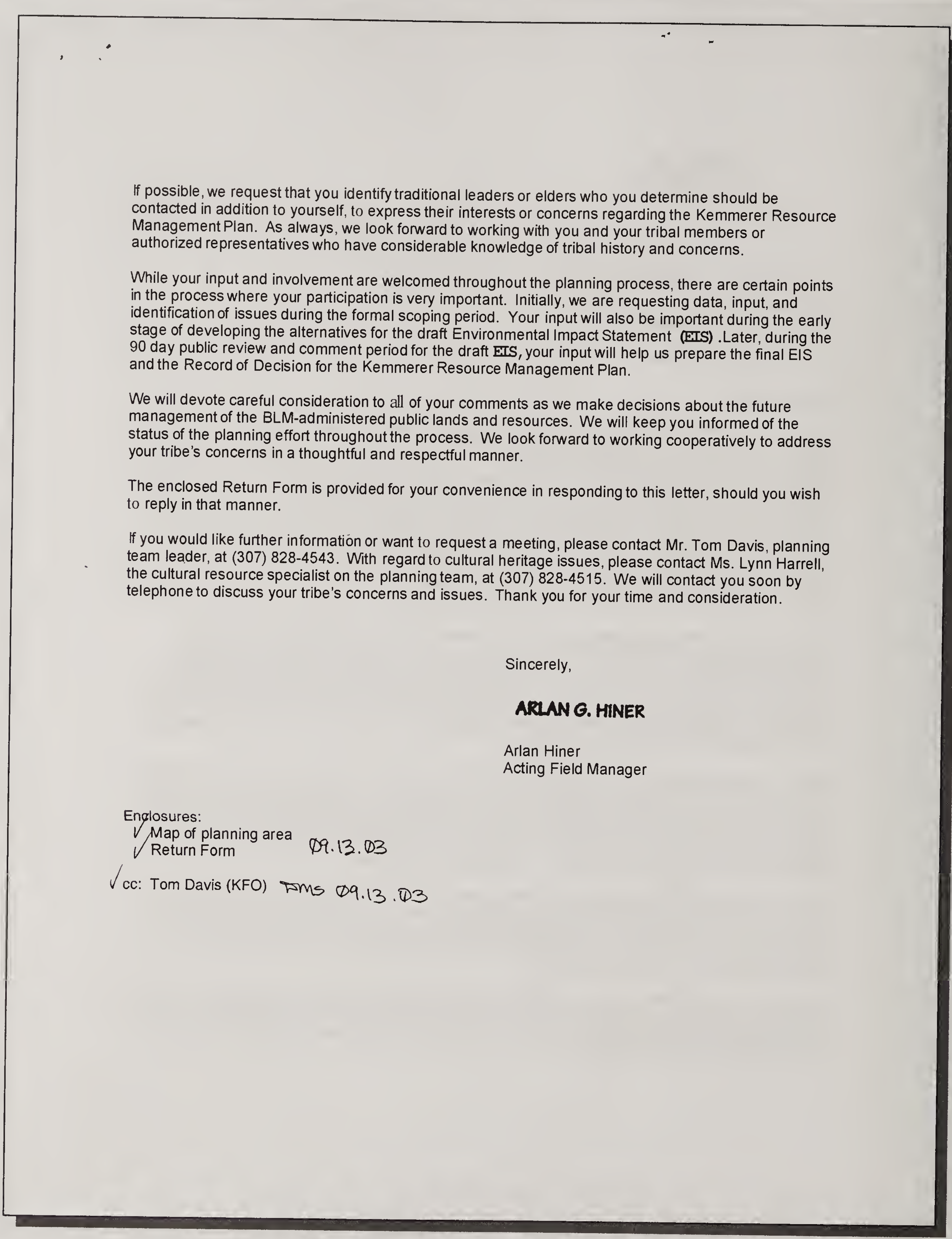

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Sincerely,

ARLAN G. HINER

Arlan Hiner
Acting Field Manager

Enclosures:
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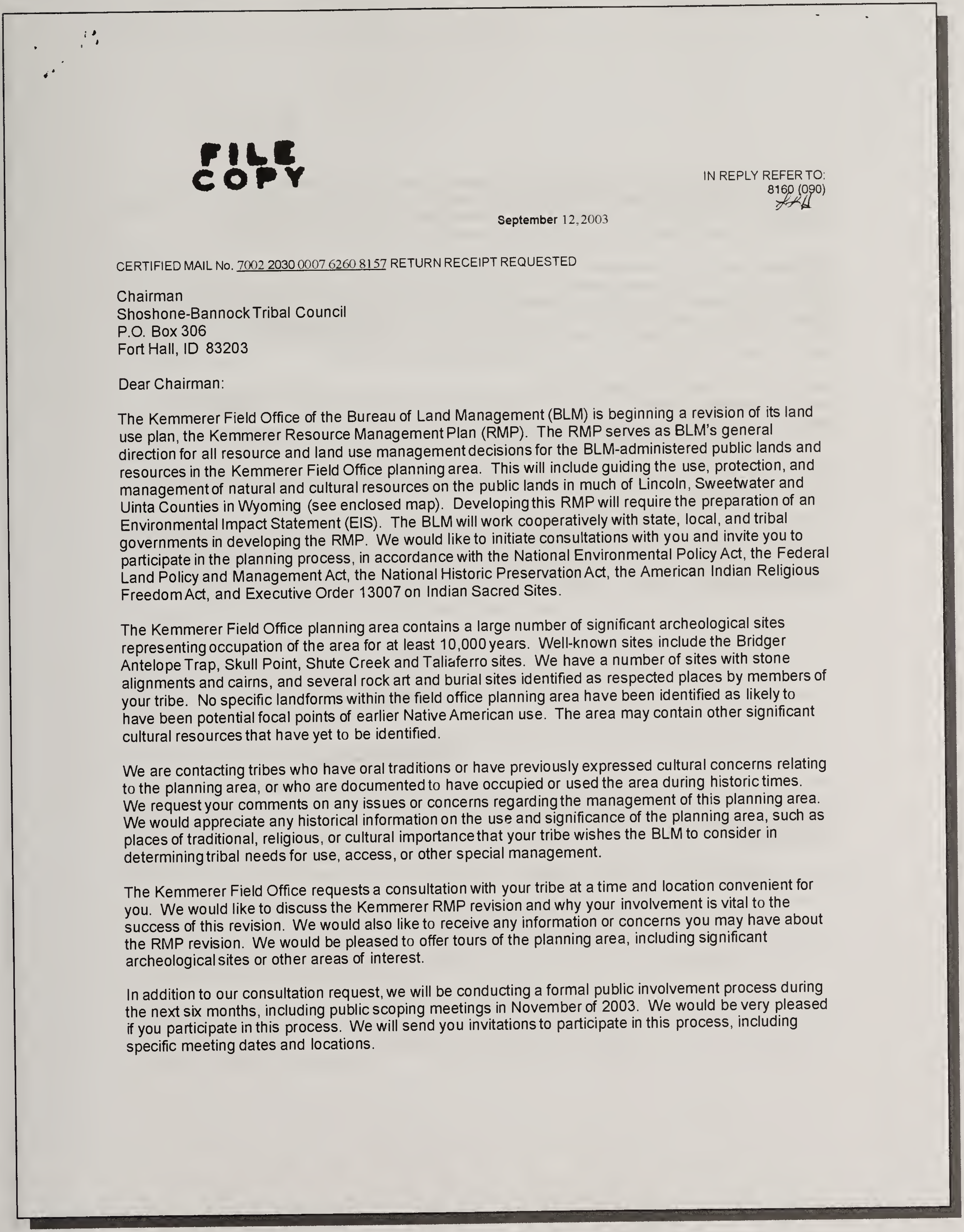
✓ Return Form 09.13.03

✓ cc: Tom Davis (KFO) TMS 09.13.03



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IN REPLY REFER TO:
8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8157 RETURN RECEIPT REQUESTED

Chairman
Shoshone-Bannock Tribal Council
P.O. Box 306
Fort Hall, ID 83203

Dear Chairman:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its land use plan, the Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in much of Lincoln, Sweetwater and Uinta Counties in Wyoming (see enclosed map). Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP. We would like to initiate consultations with you and invite you to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites.

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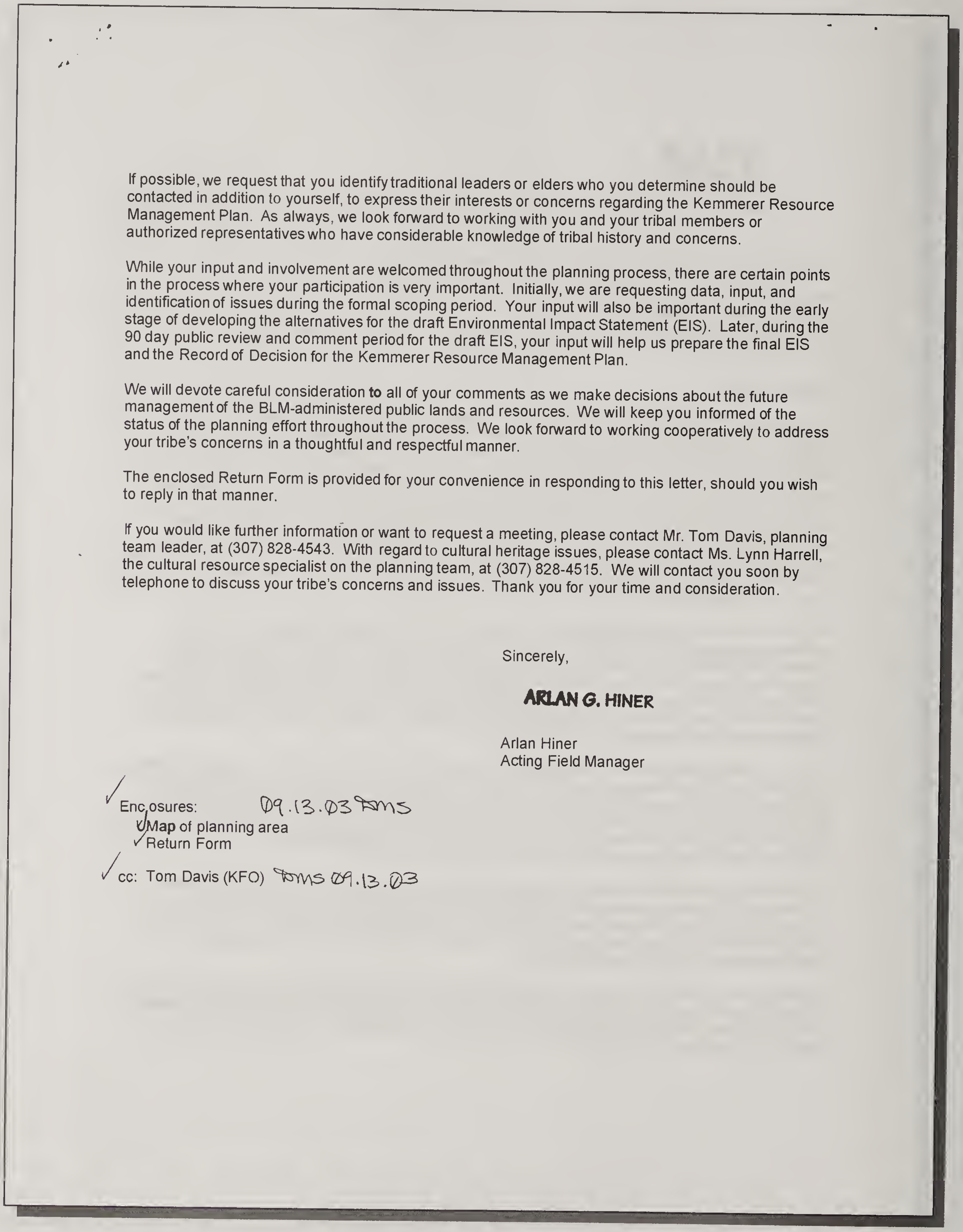

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ARLAN G. HINER

Arlan Hiner
Acting Field Manager

✓ Enclosures: 09.13.03 Toms
✓ Map of planning area
✓ Return Form

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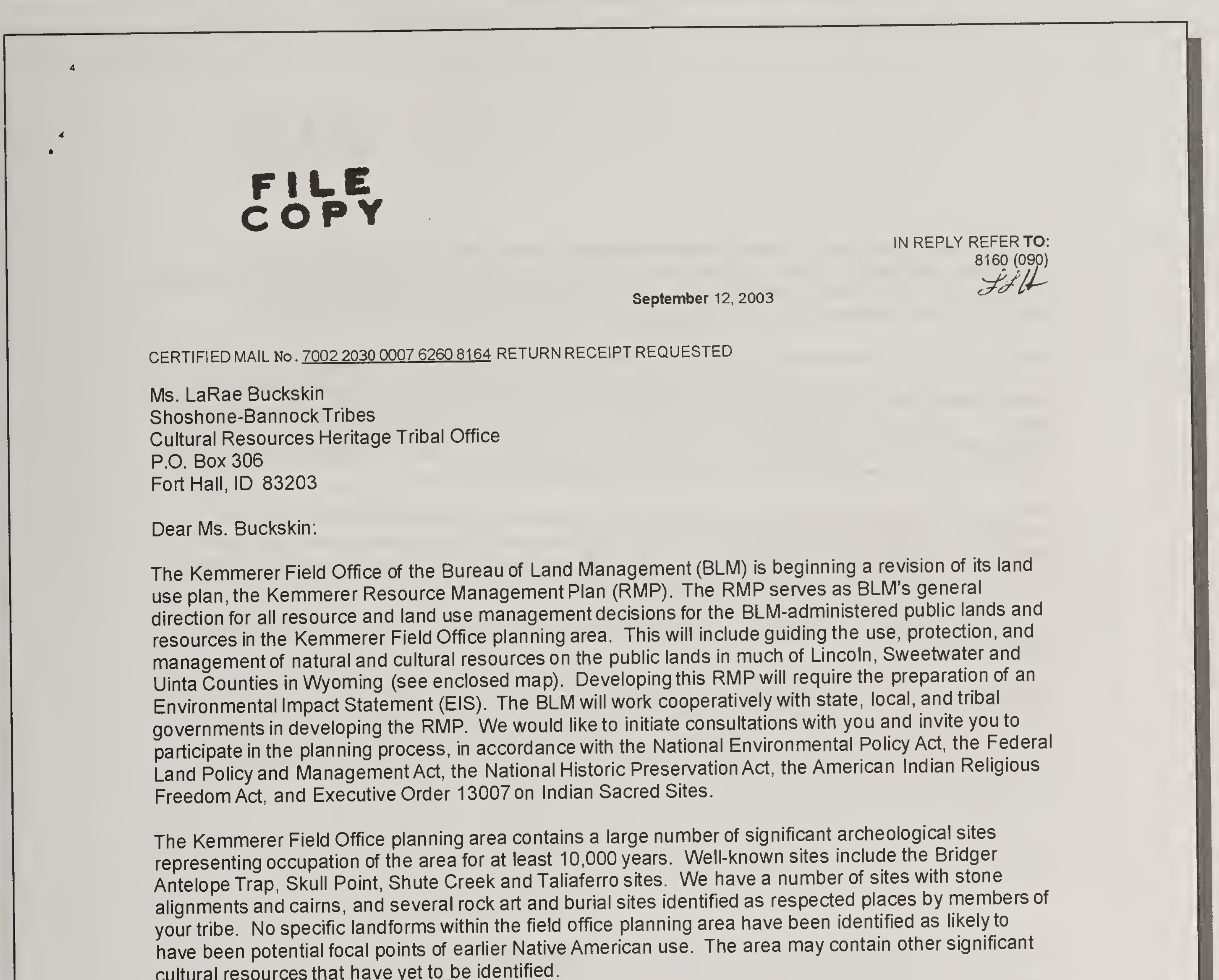

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IN REPLY REFER TO:
8160 (090)

September 12, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 8164 RETURN RECEIPT REQUESTED

Ms. LaRae Buckskin
Shoshone-Bannock Tribes
Cultural Resources Heritage Tribal Office
P.O. Box 306
Fort Hall, ID 83203

Dear Ms. Buckskin:

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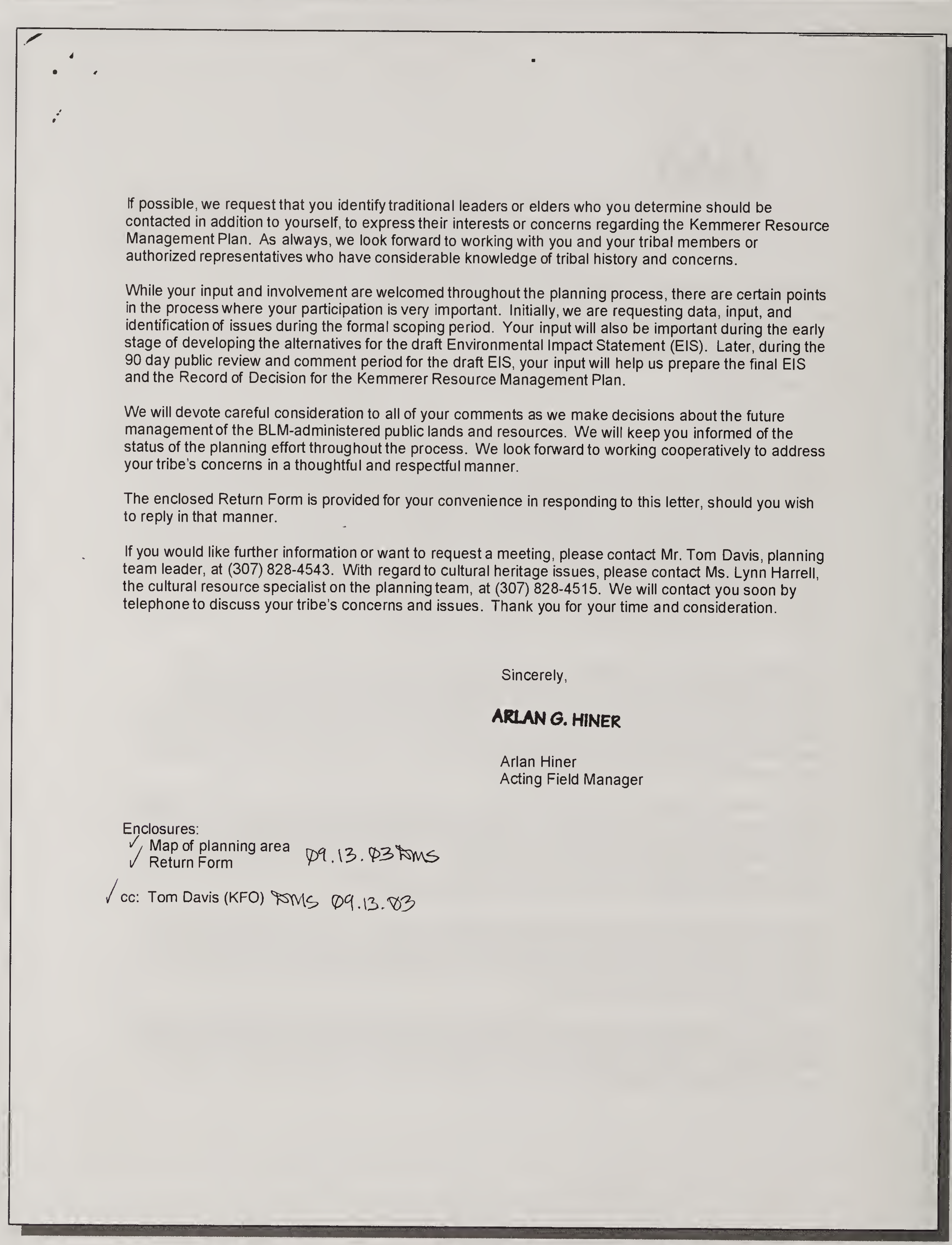

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ARLAN G. HINER

Arlan Hiner
Acting Field Manager

Enclosures:
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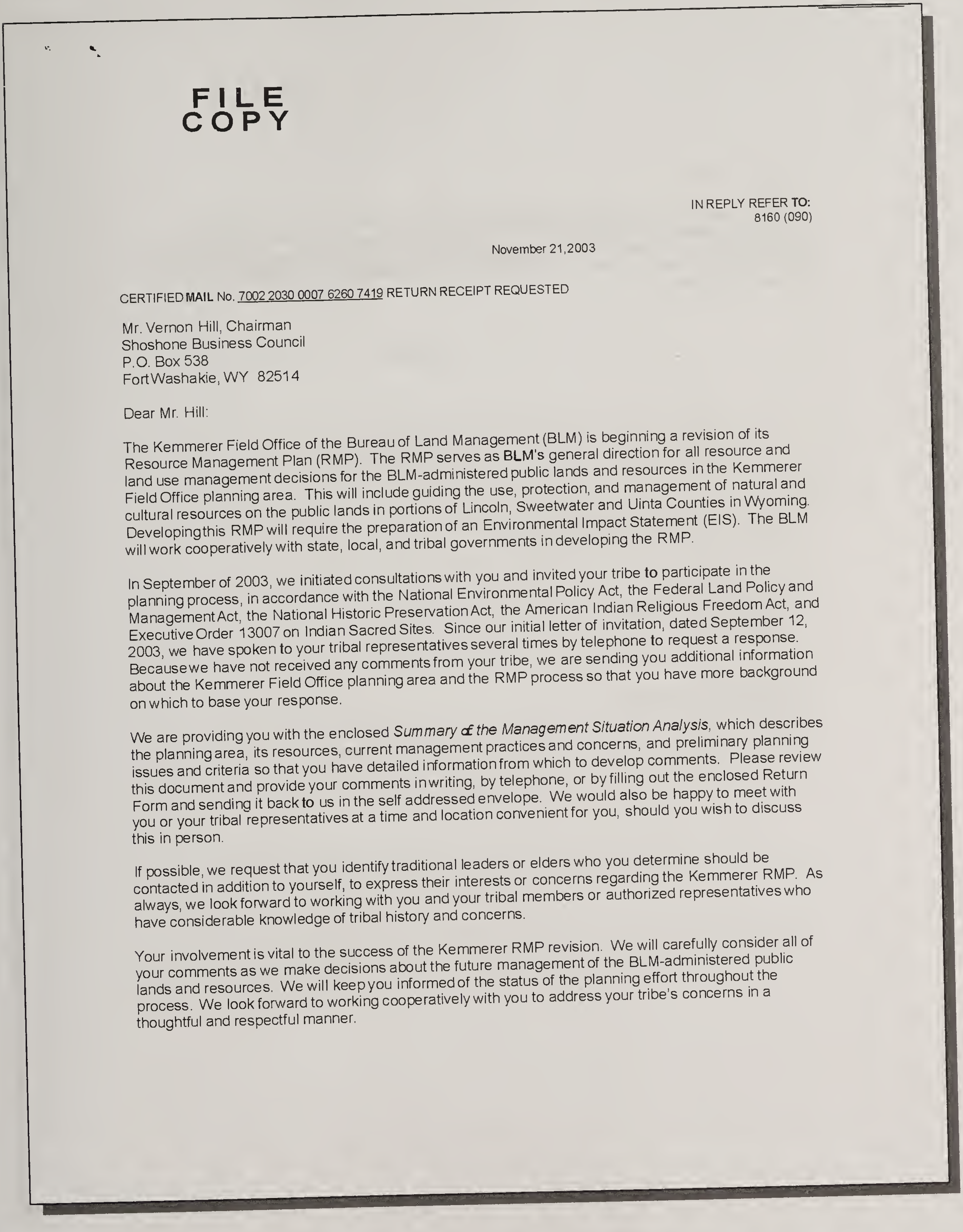
✓ cc: Tom Davis (KFO) RMS 09.13.03



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IN REPLY REFER TO:
8160 (090)

November 21, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7419 RETURN RECEIPT REQUESTED

Mr. Vernon Hill, Chairman
Shoshone Business Council
P.O. Box 538
Fort Washakie, WY 82514

Dear Mr. Hill:

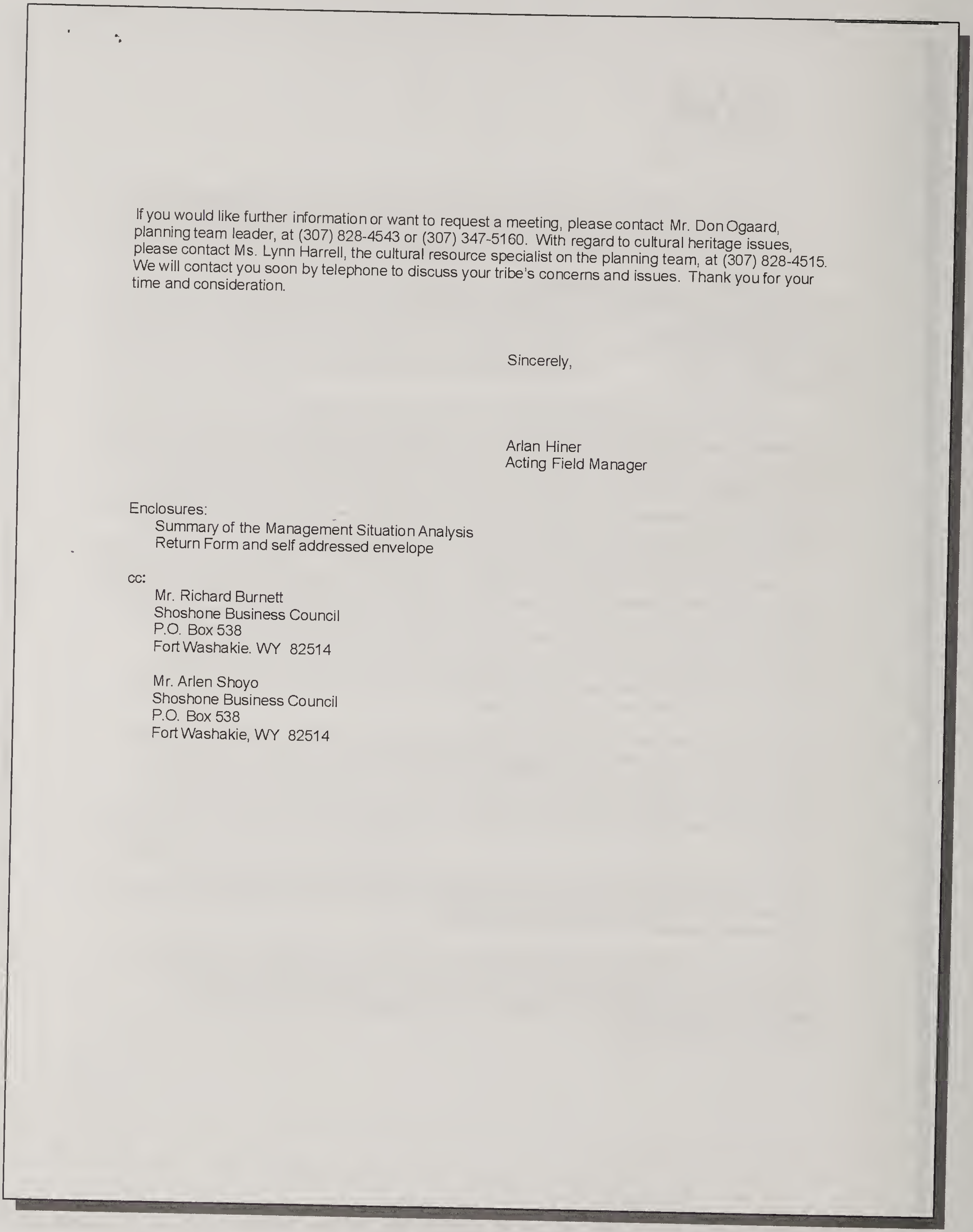
The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in portions of Lincoln, Sweetwater and Uinta Counties in Wyoming. Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP.

In September of 2003, we initiated consultations with you and invited your tribe to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites. Since our initial letter of invitation, dated September 12, 2003, we have spoken to your tribal representatives several times by telephone to request a response. Because we have not received any comments from your tribe, we are sending you additional information about the Kemmerer Field Office planning area and the RMP process so that you have more background on which to base your response.

We are providing you with the enclosed *Summary of the Management Situation Analysis*, which describes the planning area, its resources, current management practices and concerns, and preliminary planning issues and criteria so that you have detailed information from which to develop comments. Please review this document and provide your comments in writing, by telephone, or by filling out the enclosed Return Form and sending it back to us in the self addressed envelope. We would also be happy to meet with you or your tribal representatives at a time and location convenient for you, should you wish to discuss this in person.

If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer RMP. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

Your involvement is vital to the success of the Kemmerer RMP revision. We will carefully consider all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively with you to address your tribe's concerns in a thoughtful and respectful manner.



If you would like further information or want to request a meeting, please contact Mr. Don Ogaard, planning team leader, at (307) 828-4543 or (307) 347-5160. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

Sincerely,

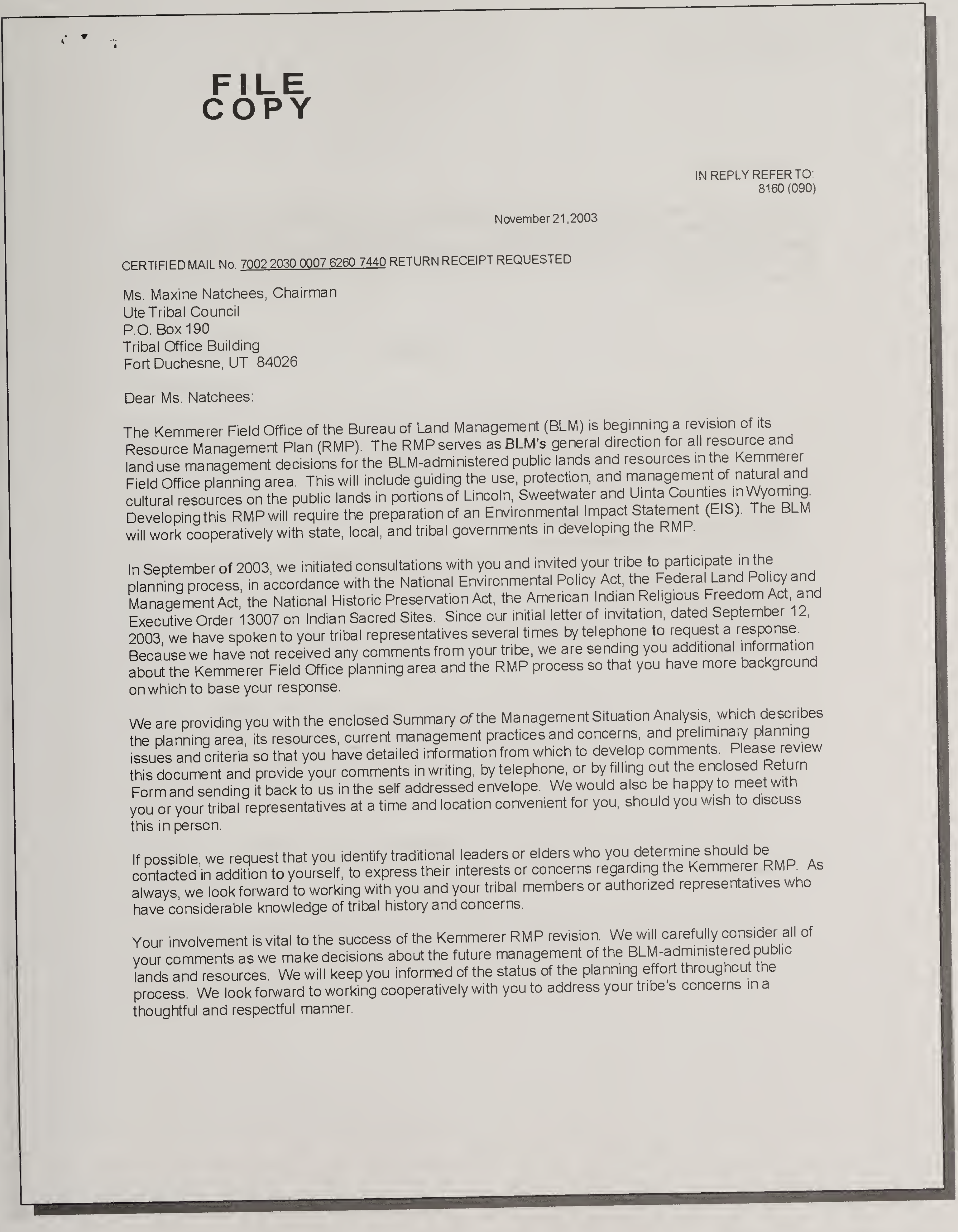
Arlan Hiner
Acting Field Manager

Enclosures:
- Summary of the Management Situation Analysis
- Return Form and self addressed envelope

cc:

Mr. Richard Burnett
Shoshone Business Council
P.O. Box 538
Fort Washakie. WY 82514

Mr. Arlen Shoyo
Shoshone Business Council
P.O. Box 538
Fort Washakie, WY 82514



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IN REPLY REFER TO:
8160 (090)

November 21, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7440 RETURN RECEIPT REQUESTED

Ms. Maxine Natchees, Chairman
Ute Tribal Council
P.O. Box 190
Tribal Office Building
Fort Duchesne, UT 84026

Dear Ms. Natchees:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in portions of Lincoln, Sweetwater and Uinta Counties in Wyoming. Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP.

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We are providing you with the enclosed Summary *of* the Management Situation Analysis, which describes the planning area, its resources, current management practices and concerns, and preliminary planning issues and criteria so that you have detailed information from which to develop comments. Please review this document and provide your comments in writing, by telephone, or by filling out the enclosed Return Form and sending it back to us in the self addressed envelope. We would also be happy to meet with you or your tribal representatives at a time and location convenient for you, should you wish to discuss this in person.

If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer RMP. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

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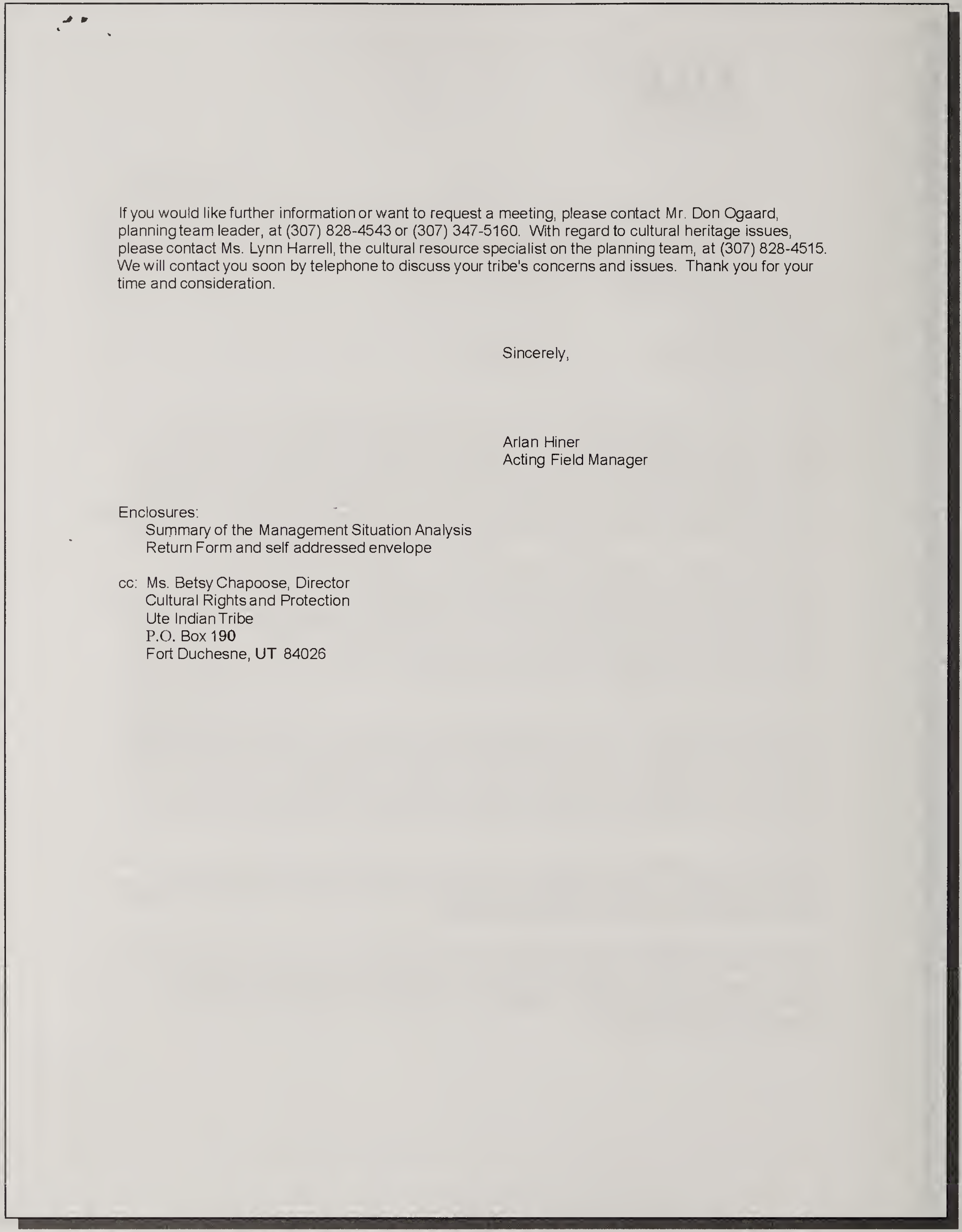


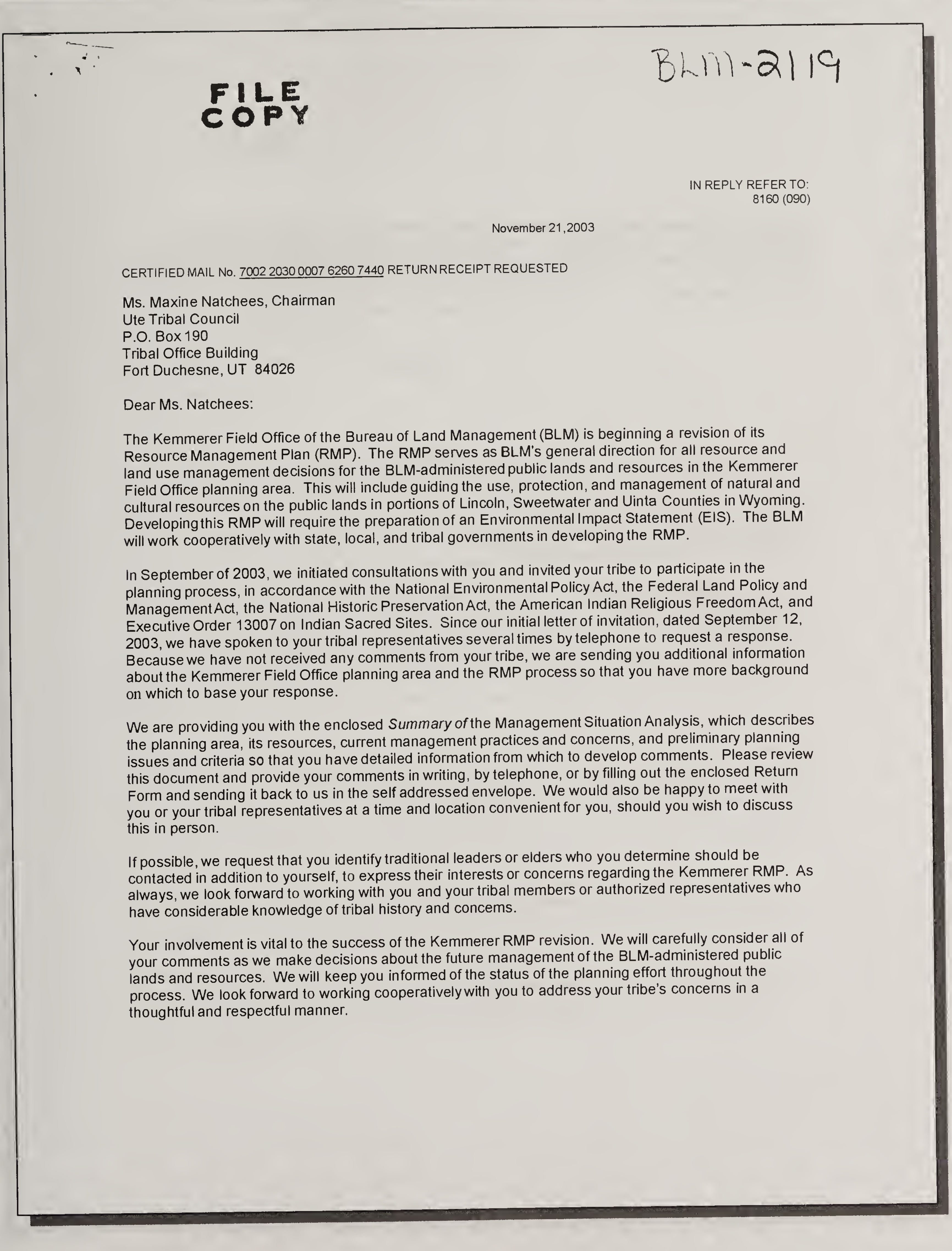
If you would like further information or want to request a meeting, please contact Mr. Don Ogaard, planning team leader, at (307) 828-4543 or (307) 347-5160. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

Sincerely,

Arlan Hiner
Acting Field Manager

Enclosures:
Summary of the Management Situation Analysis
Return Form and self addressed envelope

cc: Ms. Betsy Chapoose, Director
Cultural Rights and Protection
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, UT 84026



BLM-2119

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IN REPLY REFER TO:
8160 (090)

November 21, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7440 RETURN RECEIPT REQUESTED

Ms. Maxine Natchees, Chairman
Ute Tribal Council
P.O. Box 190
Tribal Office Building
Fort Duchesne, UT 84026

Dear Ms. Natchees:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in portions of Lincoln, Sweetwater and Uinta Counties in Wyoming. Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP.

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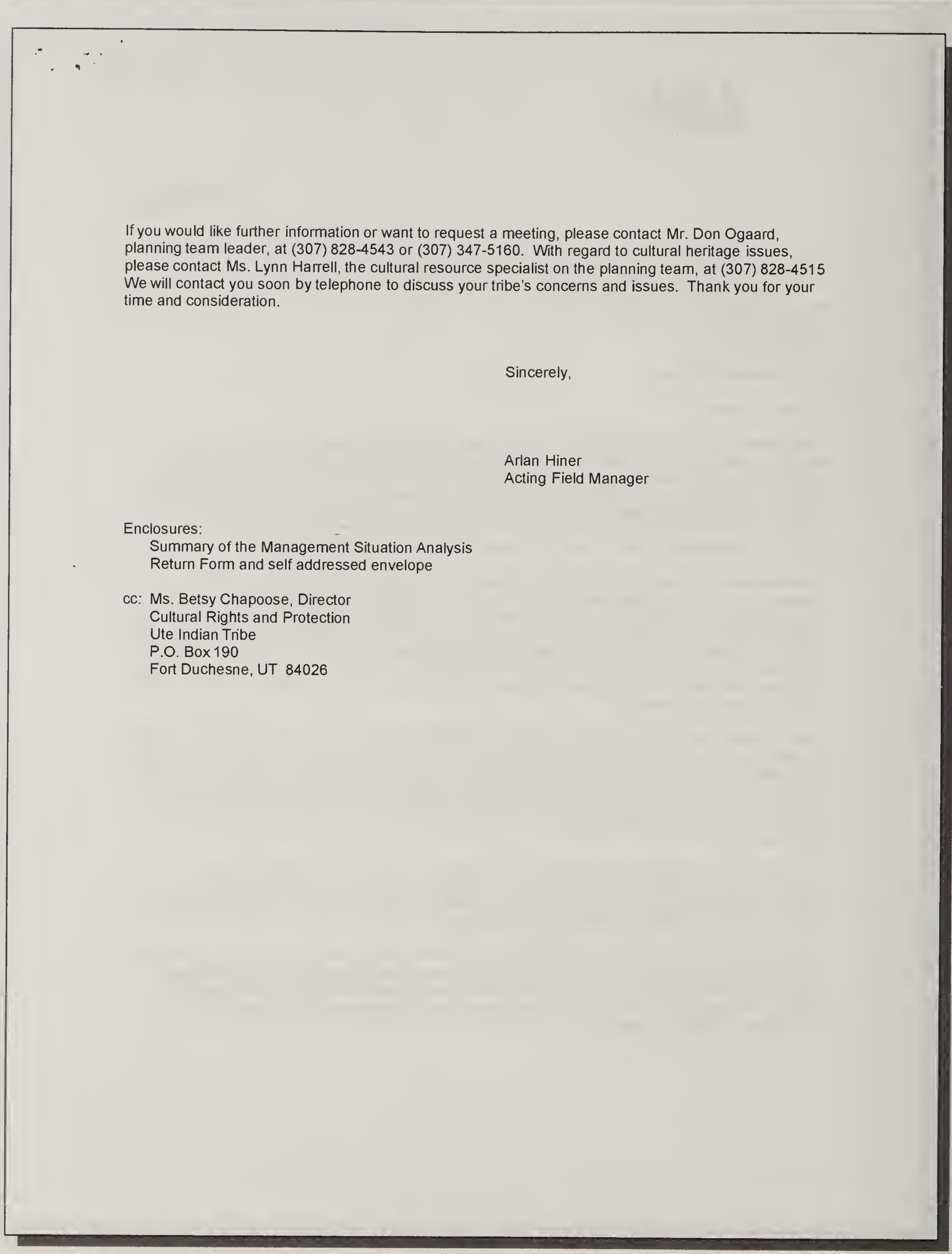

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Sincerely,

Arlan Hiner
Acting Field Manager

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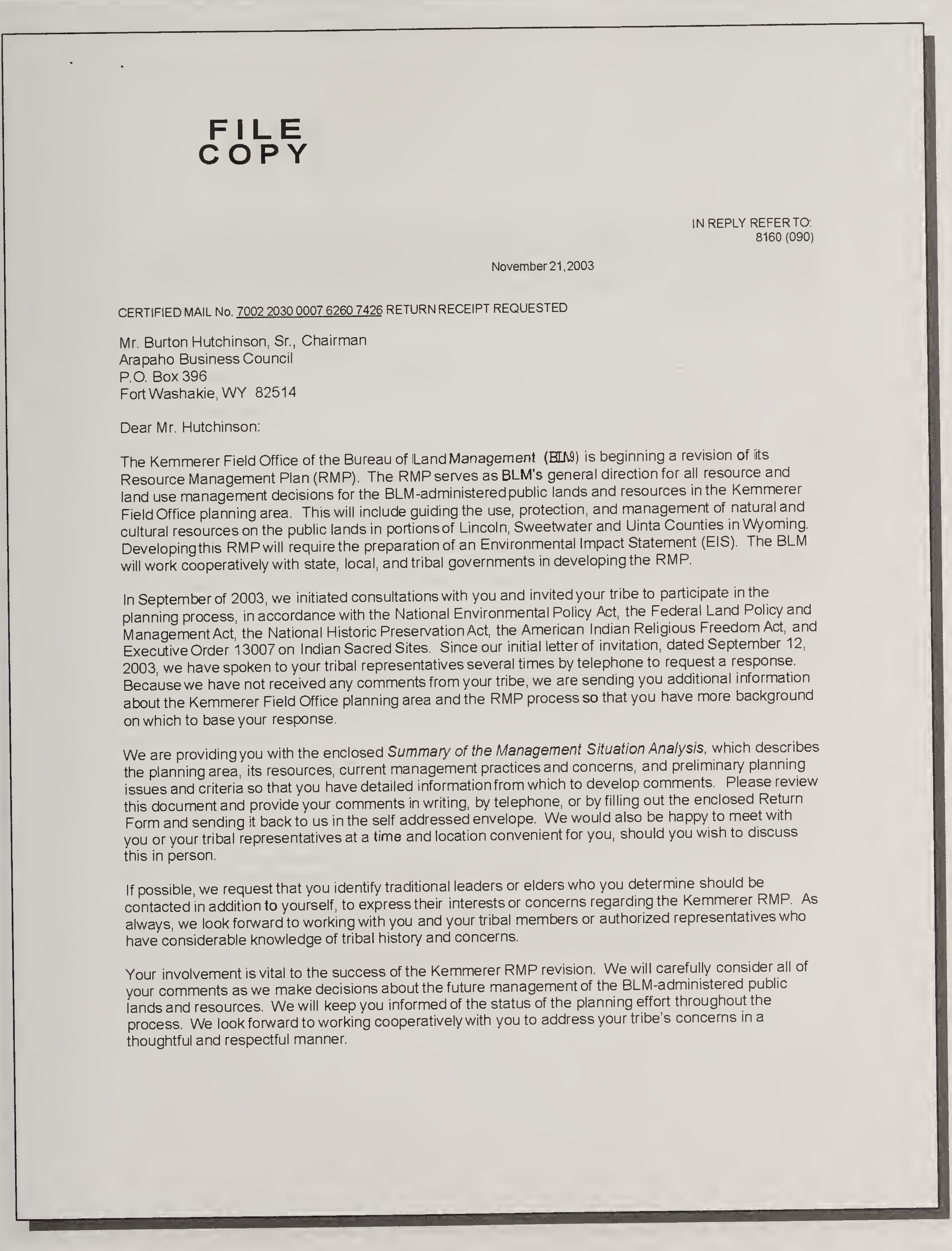
Cultural Rights and Protection
Ute Indian Tribe
P.O. Box 190
Fort Duchesne, UT 84026



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8160 (090)

November 21, 2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7426 RETURN RECEIPT REQUESTED

Mr. Burton Hutchinson, Sr., Chairman
Arapaho Business Council
P.O. Box 396
Fort Washakie, WY 82514

Dear Mr. Hutchinson:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in portions of Lincoln, Sweetwater and Uinta Counties in Wyoming. Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP.

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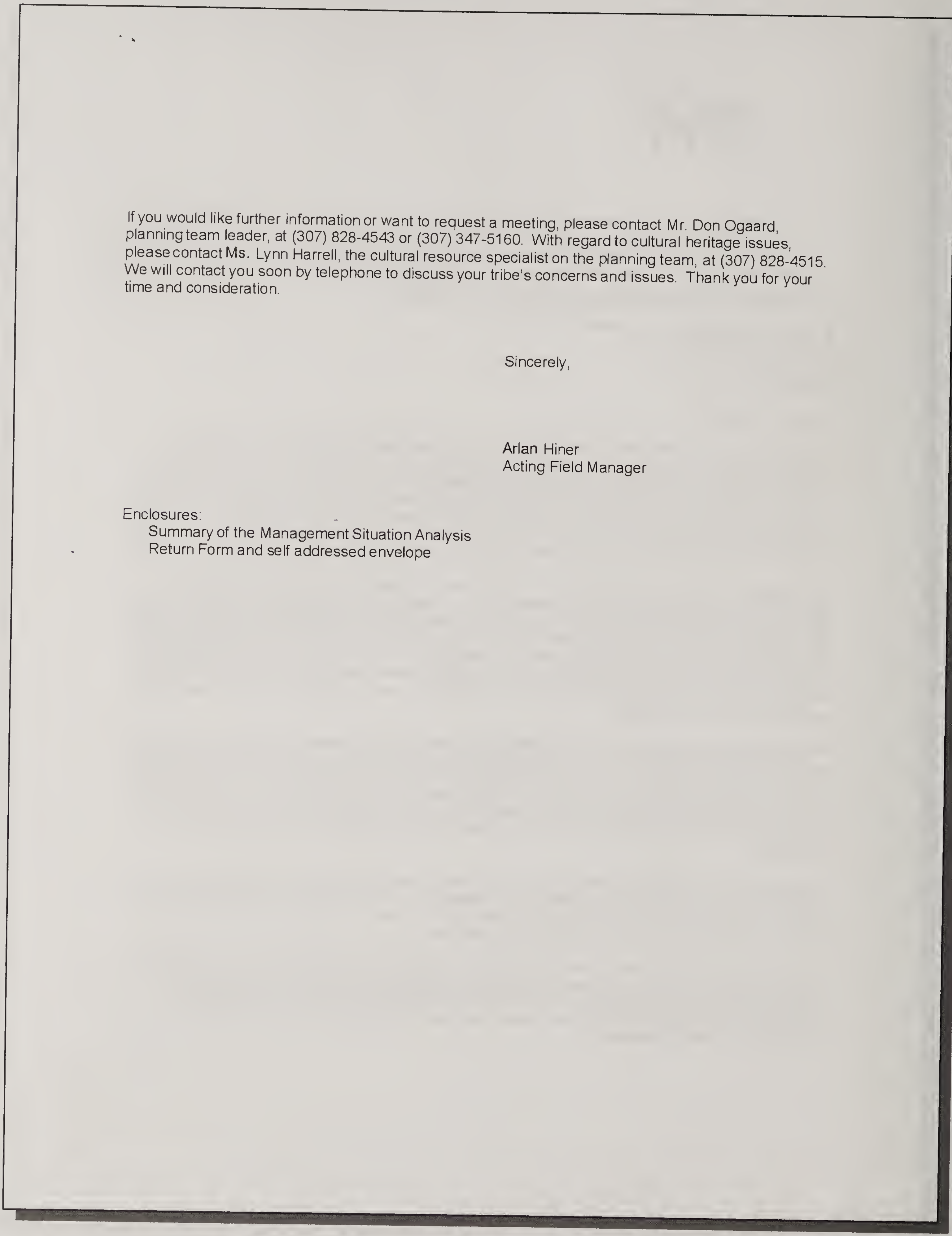
If possible, we request that you identify traditional leaders or elders who you determine should be contacted in addition to yourself, to express their interests or concerns regarding the Kemmerer RMP. As always, we look forward to working with you and your tribal members or authorized representatives who have considerable knowledge of tribal history and concerns.

Your involvement is vital to the success of the Kemmerer RMP revision. We will carefully consider all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively with you to address your tribe's concerns in a thoughtful and respectful manner.

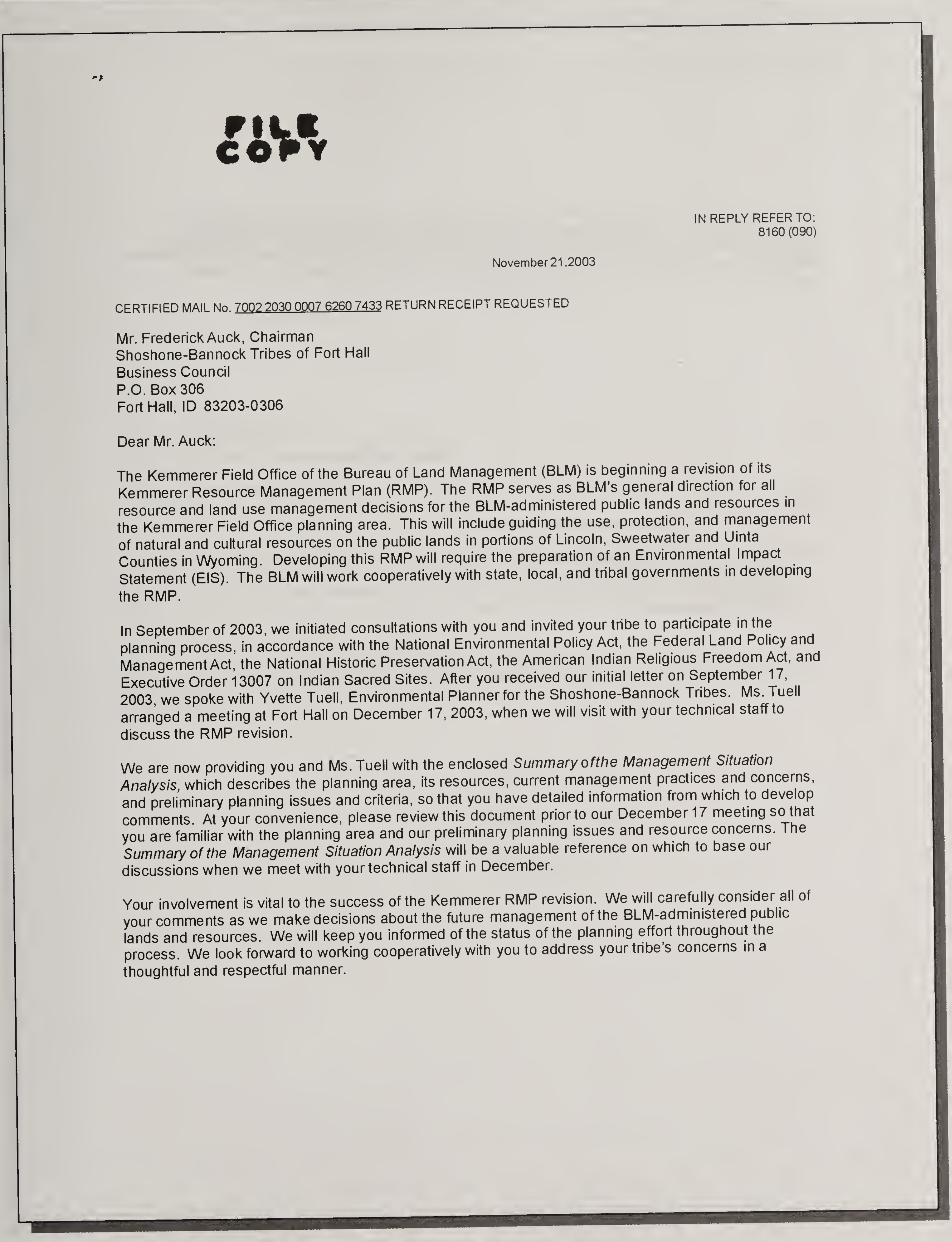


If you would like further information or want to request a meeting, please contact Mr. Don Ogaard, planning team leader, at (307) 828-4543 or (307) 347-5160. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We will contact you soon by telephone to discuss your tribe's concerns and issues. Thank you for your time and consideration.

Sincerely,

Arlan Hiner
Acting Field Manager

Enclosures:
- Summary of the Management Situation Analysis
- Return Form and self addressed envelope



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IN REPLY REFER TO:
8160 (090)

November 21.2003

CERTIFIED MAIL No. 7002 2030 0007 6260 7433 RETURN RECEIPT REQUESTED

Mr. Frederick Auck, Chairman
Shoshone-Bannock Tribes of Fort Hall
Business Council
P.O. Box 306
Fort Hall, ID 83203-0306

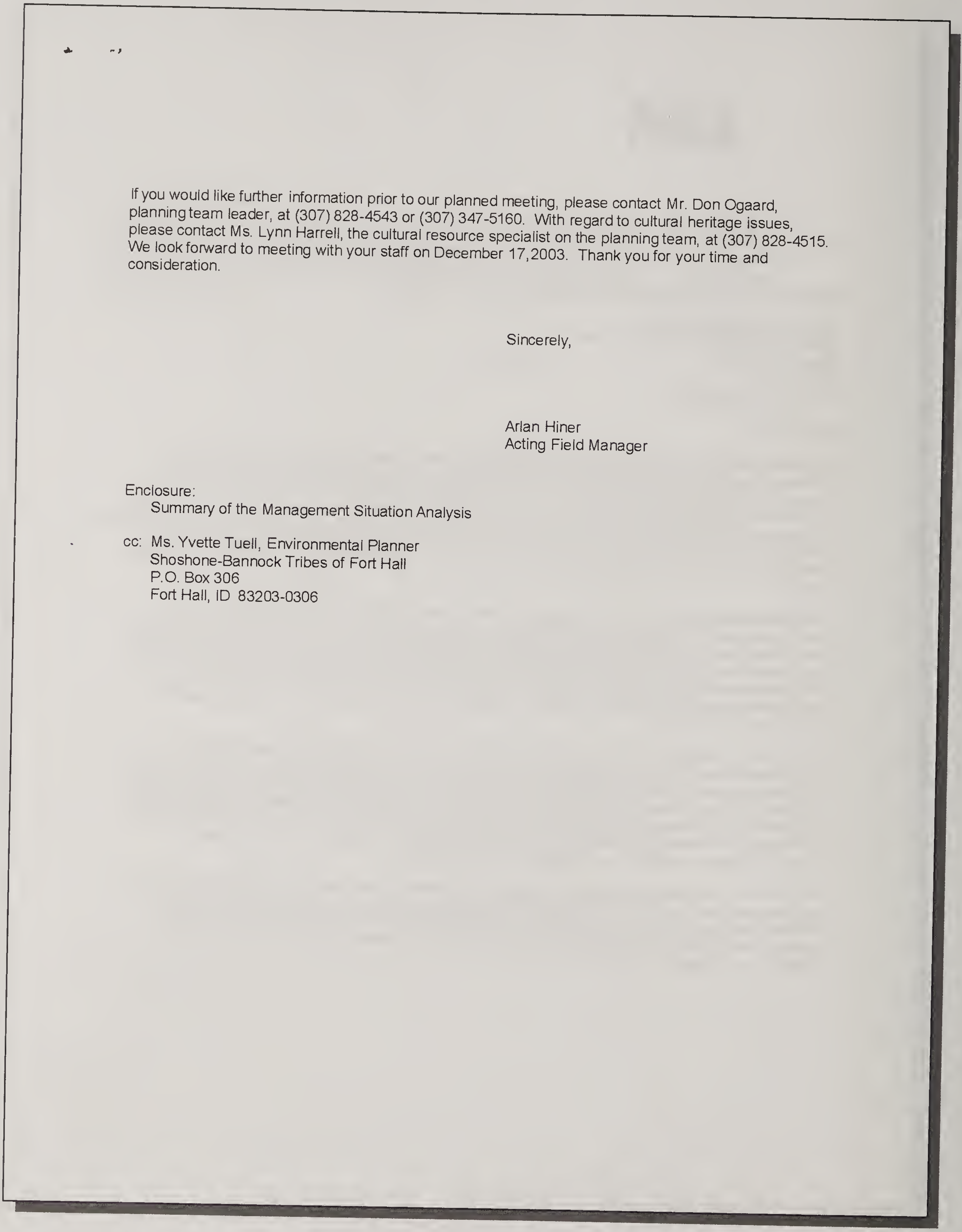
Dear Mr. Auck:

The Kemmerer Field Office of the Bureau of Land Management (BLM) is beginning a revision of its Kemmerer Resource Management Plan (RMP). The RMP serves as BLM's general direction for all resource and land use management decisions for the BLM-administered public lands and resources in the Kemmerer Field Office planning area. This will include guiding the use, protection, and management of natural and cultural resources on the public lands in portions of Lincoln, Sweetwater and Uinta Counties in Wyoming. Developing this RMP will require the preparation of an Environmental Impact Statement (EIS). The BLM will work cooperatively with state, local, and tribal governments in developing the RMP.

In September of 2003, we initiated consultations with you and invited your tribe to participate in the planning process, in accordance with the National Environmental Policy Act, the Federal Land Policy and Management Act, the National Historic Preservation Act, the American Indian Religious Freedom Act, and Executive Order 13007 on Indian Sacred Sites. After you received our initial letter on September 17, 2003, we spoke with Yvette Tuell, Environmental Planner for the Shoshone-Bannock Tribes. Ms. Tuell arranged a meeting at Fort Hall on December 17, 2003, when we will visit with your technical staff to discuss the RMP revision.

We are now providing you and Ms. Tuell with the enclosed *Summary of the Management Situation Analysis,* which describes the planning area, its resources, current management practices and concerns, and preliminary planning issues and criteria, so that you have detailed information from which to develop comments. At your convenience, please review this document prior to our December 17 meeting so that you are familiar with the planning area and our preliminary planning issues and resource concerns. The *Summary of the Management Situation Analysis* will be a valuable reference on which to base our discussions when we meet with your technical staff in December.

Your involvement is vital to the success of the Kemmerer RMP revision. We will carefully consider all of your comments as we make decisions about the future management of the BLM-administered public lands and resources. We will keep you informed of the status of the planning effort throughout the process. We look forward to working cooperatively with you to address your tribe's concerns in a thoughtful and respectful manner.



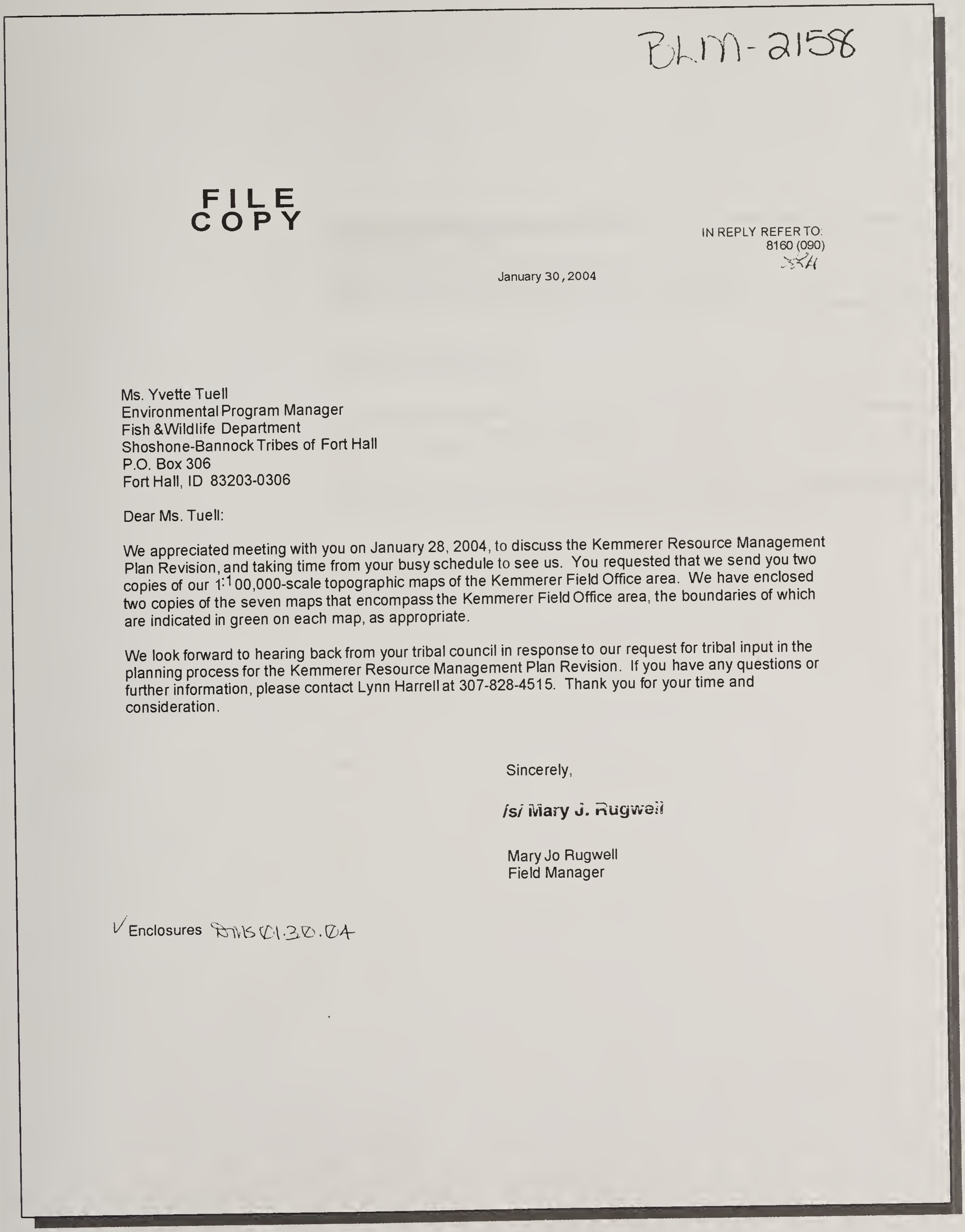
If you would like further information prior to our planned meeting, please contact Mr. Don Ogaard, planning team leader, at (307) 828-4543 or (307) 347-5160. With regard to cultural heritage issues, please contact Ms. Lynn Harrell, the cultural resource specialist on the planning team, at (307) 828-4515. We look forward to meeting with your staff on December 17, 2003. Thank you for your time and consideration.

Sincerely,

Arlan Hiner
Acting Field Manager

Enclosure:
Summary of the Management Situation Analysis

cc: Ms. Yvette Tuell, Environmental Planner
Shoshone-Bannock Tribes of Fort Hall
P.O. Box 306
Fort Hall, ID 83203-0306



BLM-2158

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IN REPLY REFER TO:
8160 (090)
JKH

January 30, 2004

Ms. Yvette Tuell
Environmental Program Manager
Fish & Wildlife Department
Shoshone-Bannock Tribes of Fort Hall
P.O. Box 306
Fort Hall, ID 83203-0306

Dear Ms. Tuell:

We appreciated meeting with you on January 28, 2004, to discuss the Kemmerer Resource Management Plan Revision, and taking time from your busy schedule to see us. You requested that we send you two copies of our 1:100,000-scale topographic maps of the Kemmerer Field Office area. We have enclosed two copies of the seven maps that encompass the Kemmerer Field Office area, the boundaries of which are indicated in green on each map, as appropriate.

We look forward to hearing back from your tribal council in response to our request for tribal input in the planning process for the Kemmerer Resource Management Plan Revision. If you have any questions or further information, please contact Lynn Harrell at 307-828-4515. Thank you for your time and consideration.

Sincerely,

/s/ Mary J. Rugwell

Mary Jo Rugwell
Field Manager

✓ Enclosures DMS 01.30.04

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KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX D

Water Disposal Requirements

Appendix D
Water Disposal Requirements

Streams and Flow Connected Surface Features Disposal Plans

Plans for any proposed activities that will result in disposal of produced water to channels on public lands will, at a minimum, contain provisions for the following in their operating plans:

- An initial survey and evaluation of the public land portion of the channel from the proposed point of discharge to the downstream extent of Bureau of Land Management (BLM)- managed lands or the confluence of the nearest perennial water with a natural base flow four times greater than the total produced water from all sources to the channel in question at the point of confluence. The evaluation will address channel geometry and record current locations (e.g., Global Positioning System, monumenting, photo points) and nature of key features, such as vegetative communities, headcuts, depositional areas, existing wetlands, any other discharges, etc. The initial report will be provided to the BLM with sufficient time prior to initial disposal of produced water to allow for analysis and adjustments to the disposal plan (including potential refusal). Subsequent reports will be provided to the BLM not more than 2 weeks past the date of the survey.
- Channels on public lands receiving produced water disposals will be resurveyed annually, at a minimum, or as requested by the BLM by the project proponent in the manner described above. The need to take corrective actions will be determined by the BLM.
- Adequate design to minimize erosion at the point of disposal and to prevent channel drops (headcuts) from traveling up channel under augmented flows and natural flow conditions post disposal.
- A method to control, in a timely manner, accelerated channel erosion. Corrective actions could include, but are not limited to, engineered structures, vegetation augmentation and (or) elimination of disposal(s) to the affected channel(s), and so on.

Upland Disposal Plans

Plans for any proposed disposal of produced water to public land uplands will, at a minimum, contain provisions for the following within their operating plan:

- Another avenue for the disposal of the water that can be used at any time.
- Certification that the water meets or exceeds Wyoming Department of Environmental Quality standards for agricultural ground water.
- Information to support analysis that application of the water to the soil will not adversely affect soil quality, including infiltration or fertility.
- Information to support analysis that vegetative diversity and productivity, soil health, and structure will not be adversely affected.
- Information to support analysis that volumes of water applied would not be in excess of that needed to establish appropriate vegetation communities.
- A statement that there will be no surface runoff from the reclamation site and that corrective actions will be taken if it occurs.
- An approved revegetation plan that includes a weed management plan.
- A monitoring plan and provisions for prompt action to address errors.
- A timeline to assure that irrigation efforts would be used to establish vegetation communities, but not maintain them.

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KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX E

Common and Scientific Names of Plant and Wildlife Species Identified in this Draft Environmental Impact Statement

Appendix E
Common and Scientific Names of Plant and Wildlife Species Identified in this Draft Environmental Impact Statement

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Draft Environmental Impact Statement

Common Name	Scientific Name
Plants	
Alder	*Alnus* spp.
Alfalfa	*Medicago sativa*
Alkali cordgrass	*Spartina gracilis*
Alkali sacaton	*Sporobolus airoides*
Astragalus	*Astragalus* spp.
Barley	*Hordeum vulgare*
Basin big sagebrush	*Artemisia tridentata* spp. *tridentata*
Beaver-rim phlox	*Phlox pungens*
Big bluegrass (Sandberg's bluegrass)	*Poa secunda*
Big sagebrush	*Artemisia tridentata*
Bigtooth maple	*Acer gradidentatum*
Birch	*Betula* spp.
Bitterbrush	*Purshia tridentata*
Black greasewood	*Sarcobatus vermiculatus*
Black henbane	*Hyoscyamus niger*
Bladderpods	*Utricularia macrorhiza*
Blue grama	*Bouteloua gracilis*
Bluebunch wheatgrass	*Agropyron spicatum*
Boxelder	*Acer negundo*
Buckwheat	*Polygonum spp.*
Buffalo grass	*Urochloa mutica*
Bulrush	*Schoenoplectus* spp.
Canada thistle	*Cirsium arvense*
Cattail	*Typha* spp.
Chokecherry	*Prunus virginiana*
Common burdock	*Arctium minus*
Common St. Johnswort	*Hypericum perforatum*
Common tansy	*Tanacetum vulgare*
Compact gilia	*Ipomopsis crebrifolia*
Cottonwood	*Populus* spp.
Currant	*Ribes* spp.
Dalmation toadflax	*Linaria genistifolia* ssp. *dalmatica*
Deep creek cinquefoil	*Potentilla multisecta*
Desert glandular phacelia	*Phacelia glandulosa* var. *deserta*
Diffuse knapweed	*Centaurea diffusa*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Draft Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Divergent wild buckwheat	*Eriogonum divaricatum*
Dorn’s twinpod	*Physaria dornii*
Douglas fir	*Pseudotsuga menziesii*
Douglas’ campion	*Silene douglasii*
Downy brome (cheatgrass)	*Bromus tectorum*
Dwarf mistletoe	*Arceuthobium pusillum*
Dyers woad	*Isatis tinctoria*
Englemann spruce	*Picea engelmannii*
Entire-leaved peppergrass	*Lepidium integrifolium var. integrifolium*
Erect cryptantha	*Cryptantha stricta*
Field bindweed	*Convolvulus arvensis*
Fullstem	*Chamaechaenactis scaposa*
Gardner saltbush	*Atriplex garnderi*
Garrett’s beardtongue	*Penstemon scariosus* var. *garrettii*
Goldenweed	*Pyrrocoma* spp.
Greasewood	*Sarcobatus vermiculatus*
Great Basin downingia	*Downingia laeta*
Green rabbitbrush	*Chrysothamnus viscidiflorus*
Hawthorn	*Crataegus* spp.
Hayden’s Milkvetch	*Astragalus bisulcatus* var. *haydenianus*
Hoary cress (whitetop)	*Cardaria draba and Cardaria pubescens Desv.*
Houndstongue	*Cynoglossum offinale*
Idaho fescue	*Festuca idahoensis*
Inland saltgrass	*Distichlis spicata*
Japanese brome	*Bromus japonicus*
Juniper	*Juniperus* spp.
Juniper prickly pear	*Opuntia polyacantha* var. *juniperina*
King’s Milkvetch	*Astragalus calycosus* var. *calycosus*
Knapweed	*Centaurea* spp.
Large-fruited bladderpod	*Lesquerella macrocarpa*
Leafy spurge	*Euphorbia esula*
Limber pine	*Pinus flexilis*
Locoweed	*Astragalus* spp.
Lodgepole pine	*Pinus contorta*
Low bladderpod	*Lesquerella prostrata*
Lupine	*Lupinis* spp.
Milkvetch	*Astragalus* spp.
Moab milkvetch	*Astragalus coltonii* var. *moabensis*
Mountain big sagebrush	*Artemisia tridentata* var. *vaseyana*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Draft Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Mountain mahogany	*Cercocarpus montanus*
Musk thistle	*Carduus nutans*
Narrowleaf goldenweed	*Haplopappus macronema* var. *linearis*
Narrow-leaved bladderpod	*Lesquerella parvula*
Needle-and-thread	*Stipa comata*
Nevada sweetpea	*Lathyrus lanszwertii* var. *lanszwertii*
Old man's whiskers	*Geum triflorum*
Ox-eye daisy	*Chrysanthemum leucanthemum*
Penstemon	*Penstemon* spp.
Perennial pepperweed (giant whitetop)	*Lepidium latifolium*
Perennial sowthistle	*Sonchus arvensis*
Phlox	*Phlox* spp.
Plumeless thistle	*Carduus acanthoides*
Ponderosa pine	*Pinus ponderosa*
Prairie cordgrass	*Spartina pectinata*
Prairie junegrass	*Koeleria macrantha*
Prostrate bladderpod	*Lesquerella prostrata*
Purple loosestrife	*Lythrum salicaria*
Quackgrass	*Agropyron repens*
Quaking aspen	*Populus tremuloides*
Richardson's geranium	*Geranium richardsonii*
Rocky Mountain juniper	*Juniperus scopulorum*
Rocky Mountain maple	*Acer glabrum*
Rufous-spine prickly pear	*Opuntia polyacantha* var. *rufispina*
Rushes	*Juncus* spp.
Russian knapweed	*Centaurea repens*
Sagebrush	*Artemisia* spp.
Salt cedar (tamarisk)	*Tamarix gallica*
Saltbush	*Atriplex* spp.
Saltgrass	*Distichlis spicata*
Sandberg's bluegrass (big bluegrass)	*Poa secunda*
Scotch thistle	*Onopordum acanthium*
Seablite	*Suaeda esteroa*
Sedge	*Carex* spp.
Serviceberry	*Amerlanchier alnifolia*
Shadscale saltbush	*Atriplex confertifolia*
Shrubby cinquefoil	*Dasiphora floribunda*
Sickle saltbush	*Atriplex falcata*
Silver sagebrush	*Artemisia canescens*
Skeletonleaf bursage	*Franseria discolor Nutt.*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Draft Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Snowberry	*Symphoricarpos* spp.
Sodaville milkvetch	*Astragalus lentiginosus* var. *salinus*
Spike fescue	*Leucopoa kingii*
Spotted knapweed	*Centaurea maculosa*
Spruce	*Picea* spp.
St. Johnswort	*Hypericum* spp.
Subalpine fir	*Abies lasiocarpa*
Swallen mountain ricegrass	*Achnatherum swallenii*
Tansy	*Tanacetum vulgare*
Thickleaf pepperweed	*Lepidium integrifoium* var. *integrifolium*
Threadleaf sedge	*Carex filifolia*
Trelease's racemouse milkvetch	*Astragalus racemosus* var. *treleasei*
Tufted twinpod	*Physaria condensata*
Tunp range twinpod	*Physaria dornii*
Twinpods	*Physaria didymocarpa*
Uinta greenthread	*Thelesperma pubescens*
Utah juniper	*Juniperus osteosperma*
Ute ladies'-tresses	*Spiranthes diluvialis*
Western bladderpod	*Lesquerella multiceps*
Western wheatgrass	*Pascopyrum smithii*
White-margined phlox	*Phlox albomarginata*
Wild oats	*Avena fatua*
Wild plum	*Prunus americana*
Willow	*Salix* spp.
Wyoming big sagebrush	*Artemisia tridentata* var. *wyomingensis*
Yellow toadflax	*Linaria vulgaris*
Yellowstar thistle	*Centaurea solstitialis*
Fish	
Bluehead sucker	*Catostomus discobolus*
Bonneville cutthroat trout	*Oncorhynchus clarkii utah*
Bonytail	*Gila elegans*
Colorado pikeminnow	*Ptychocheilus lucius*
Colorado River cutthroat trout	*Oncorhynchus clarkii pleuriticus*
Common carp	*Cyprinus carpio*
Cutthroat trout	*Oncorhynchus clarki*
Flannelmouth sucker	*Catostomus latipinnis*
Humpback chub	*Gila cypha*
Leatherside chub	*Snyderichthys copei*
Razorback sucker	*Xyrauchen texanus*
Roundtail chub	*Gila robusta*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Draft Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Snake River cutthroat trout	*Oncorhynchus clarkii*
Wildlife	
American avocet	*Recurvirostra americana*
American kestrel	*Falco sparverius*
American marten	*Martes americana*
Badger	*Taxidea taxus*
Bald eagle	*Haliaeetus leucocephalus*
Beaver	*Castor canadensisis*
Bison	*Bison bison*
Black bear	*Ursus americanus*
Black-footed ferret	*Mustela nigripes*
Blue grouse	*Dendragapus obscurus*
Bobcat	*Lynx rufus*
Boreal chorus frog	*Pseudacris maculata*
Boreal toad	*Bufo boreas boreas*
Boreal western toad	*Bufo boreas*
Brewer's sparrow	*Spizella breweri*
Burrowing owl	*Speotyto cunicularia*
Canada geese	*Branta canadensis*
Canada lynx	*Lynx canadensis*
Cinnamon teal	*Anas cyanoptera*
Columbia spotted frog	*Rana luteiventris*
Cooper's hawk	*Accipiter cooperii*
Cottontail rabbit	*Sylvilagus* spp.
Coyote	*Canis latrans*
Eastern short-horned lizard	*Phrynosoma douglassii brevirostre*
Ferruginous hawk	*Buteo regalis*
Golden eagle	*Aquila chrysaetos*
Gray wolf	*Canis lupus*
Great Basin spadefoot toad	*Spea intermontana*
Greater sage-grouse	*Centrocercus urophasianus*
Great horned owl	*Bubo virginianus*
Grizzly bear	*Ursus arctos horribilis*
Ground squirrels	*Spermophilus* spp.
Idaho pocket gopher	*Thomomys idahoensis*
Jackrabbit	*Lepus* spp.
Killdeer	*Charadrius vociferus*
Loggerhead shrike	*Lanius ludovicianus*
Long-billed curlew	*Numenius americanus*
Long-eared myotis	*Myotis evotis*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Draft Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Long-eared owl	*Asio otus*
Mallard	*Anas platyrhynchos*
Mink	*Mustela vison*
Moose	*Alces alces*
Mountain lion	*Puma concolor*
Mountain plover	*Charadrius montanus*
Mourning dove	*Zenaida macroura*
Mule deer	*Odocoileus hemionus*
Muskrat	*Ondata zibethicus*
Northern goshawk	*Accipiter gentilis*
Northern harrier	*Circus cyaneus*
Northern leopard frog	*Rana pipiens*
Northern saw-whet owl	*Aegolius acadicus*
Osprey	*Pandion haliaetus*
Peregrine falcon	*Falco peregrinus*
Plains pocket gopher	*Geomys bursarius*
Porcupine	*Erethizon dorsatum*
Prairie dog	*Cynomys* spp.
Prairie falcon	*Falco mexicanus*
Pronghorn	*Antilocapra americana*
Pygmy rabbit	*Brachylagus idahoensis*
Raccoon	*Procyon lotor*
Red fox	*Vulpes vulpes*
Red squirrel	*Tamiasciurus hudsonicus*
Red-naped sapsucker	*Sphyrapicus nuchalis*
Red-tailed hawk	*Buteo jamaicensis*
Rock dove	*Columba livia*
Rocky Mountain elk	*Cervus elaphus*
Rough-legged hawk	*Buteo lagopus*
Rubber boa	*Charina bottae*
Ruffed grouse	*Bonasa umbellus*
Sage sparrow	*Amphispiza belli*
Sage thrasher	*Oreoscoptes montanus*
Sagebrush lizard	*Sceloporus graciosus*
Sharp-shinned hawk	*Accipiter striatus*
Short-eared owl	*Asio flammeus*
Snowshoe hare	*Lepus americanus*
Snowy owl	*Bubo scandiacus*
Spotted frog	*Rana* spp.
Spotted skunk	*Spilogale gracilis*

Table E-1. Common and Scientific Names of Plant and Wildlife Species Identified in the Draft Environmental Impact Statement *(Continued)*

Common Name	Scientific Name
Striped skunk	*Mephitis mephitis*
Swainson's hawk	*Buteo swainsoni*
Swift fox	*Vulpes velox*
Tiger salamander	*Ambystoma tigrinum*
Trumpeter swan	*Cygnus buccinator*
Turkey vulture	*Cathartes aura*
Wandering garter snake	*Thamnophis elegans vagrans*
Warbling vireo	*Vireo gilrus*
White-faced ibis	*Plegadis chihi*
White-tailed jackrabbit	*Lepus townsendii*
White-tailed prairie dog	*Cynomys leucurus*
Wolverine	*Gulo gulo*
Woodrat	*Neotoma* spp.
Yellow-billed cuckoo	*Coccyzum americanus*
Invertebrates	
Douglas-fir bark beetle	*Dendroctonus pseudotsugae*
Grasshopper	*Orchelimum vulgare*
Mormon cricket	*Anabrus simplex*
Mosquito	*Culicidae* spp.
Mountain pine beetle	*Dendroctonus ponderosae*
Western balsam bark beetle	*Dryocoetes confusus*
Alfalfa weevil	*Hypera postica*
Beet leafhopper	*Circulifer tenellus*
Cattle grub	*Hypoderma lineatum*

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KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX F

Exception, Modification, and Waiver Criteria

Appendix F
Exception, Modification, and Waiver Criteria

PROCESSING EXCEPTIONS TO SEASONAL RESTRICTIONS

A request for an exception must be initiated in writing to the field manager by the public land user near the time of conducting the work. To assist with project planning, the request should be made at least 7 days before the proposed construction date. The unpredictability of weather, animal movement and condition, and so on, precludes analysis of requests more than 1 week before the proposed construction time periods. Some species may require reanalysis every 2 weeks to ensure that conditions have not changed, which could result in adverse impacts to the species.

Each request is considered a unique action and is analyzed and documented individually for Resource Management Plan and National Environmental Policy Act compliance. Processing also may include coordination with the Wyoming Game and Fish Department (WGFD).

Exceptions to Seasonal Restrictions

Activities within the planning area are managed with seasonal restrictions, no surface occupancies, or distance restrictions for sensitive and crucial habitats. Protective wildlife seasonal restrictions are consistent with statewide dates and (or) distances. For example, big game crucial winter ranges are protected from November 15 through April 30. This restriction is intended to protect big game if weather or other habitat needs dictate.

The Bureau of Land Management (BLM) can and does grant exceptions to seasonal restrictions if the BLM, in consultation with the WGFD, feels that granting an exception would not adversely impact the population being protected. The BLM uses a set of criteria when considering a request for an exception. Professional judgment plays a key part in the BLM's decisions on whether to grant exceptions. No clear-cut formula exists.

The following section is an example of factors considered by the BLM when determining whether a request for an exception to crucial big game winter range should be granted. Similar criteria and (or) data are used when considering granting exceptions for other protected species, such as greater sage-grouse, elk calving areas, mountain plover, and pygmy rabbits.

Factors Considered

1. Resource Concerns
    - Animal presence or absence
    - Additional or new resource concerns
    - Potential for increased wildlife accidents or poaching

2. Animal Conditions
    - Physical condition of individual animals (e.g., fat reserves)
    - Local animal population condition (animal density)
    - Potential for additive mortality
    - Likelihood of introduction or increased incidence of disease
    - Likelihood of decreased recruitment/birth rate

3. Climate/Weather
    - Snow conditions (depth, crusting, longevity)
    - Current and historic local precipitation patterns
    - Current and historical seasonal weather patterns
    - Recent and current windchill factors (indication of animals energy use)
    - Duration of condition
    - Short- and long-range forecasts
4. Habitat Condition and Availability
    - Water and forage condition (availability, quality, and quantity)
    - Competition (interspecific, intraspecific)
    - Animal use of available forage
    - Suitable and ample forage immediately available and accessible
5. Spatial Considerations
    - Migration/travel corridors
    - Winter range, foraging, parturition or breeding
    - Topography (plains vs. mountains)
    - Topographic/geographic limitations (barriers)
    - Presence of thermal cover (e.g., protection from wind)
    - Proportion of range impacted
    - Juxtaposition and density of other activities/disturbances in the vicinity
    - Cumulative impacts
6. Timing
    - When proposed activity would occur in the stipulation period
    - Kind and duration of potentially disruptive activity
    - Likelihood of animals habituating to the proposed activity

Modification or Waiver of Lease Stipulations

Title 43 CFR 3101.1-4 establishes procedures for granting modifications or waivers to oil and gas lease stipulations, as stated below:

> *A stipulation included in an oil and gas lease shall be subject to modification or waiver only if the authorized officer determines that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or if proposed operations would not cause unacceptable impacts. If the authorized officer has determined, prior to lease issuance, that a stipulation involves an issue of major concern to the public, modification or waiver of the stipulation shall be subject to public review for at least a 30-day period. In such cases, the stipulation shall indicate that public review is required before modification or waiver. If subsequent to lease issuance the authorized officer determines that a modification or waiver of a lease term or stipulation is substantial, the modification or waiver shall be subject to public review for at least a 30-day period.*

The modification or waiver of an oil and gas lease stipulation implies that the sensitive resource for which the protective measure was considered is in some way not present in the area or in some way no longer in need of the protective measure. In either case, consideration of a modification or waiver of a lease stipulation would require environmental analysis and may result in an amendment to the land use plan.

KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX G

Lands Identified for Disposal

Appendix G
Lands Identified for Disposal

Lands Identified for Potential Disposal Under Alternatives A and C

Main Portion of the Resource Area

Range 110
T. 18 N., R. 110 W.
Sec. 14: All

Range 111
T. 18 N., R. 111 W.
Sec. 14: All

T. 19 N., R. 111 W.
Sec. 28: SE¼

Range 112
T. 20 N., R. 112 W.
Sec. 20: SE¼NE¼, SE¼SW¼, NW¼SE¼
Sec. 28: N½NE¼, SE¼NE¼, NE¼NW¼, E½SE

T. 22 N. R. 112 W.
Sec. 18: All

T. 23 N., R. 112 W.
Sec. 12: SE¼SW¼SW¼, SW¼SE¼SE¼
Sec. 13: NE¼NW¼NE¼, NW¼NE¼NE¼

T. 26 N., R. 112 W.
Sec. 6: Lots 3, 4, 5, 9, and 12 to 29 inclusive
Sec. 7: Lot 5

Range 113
T. 21 N., R. 113 W.
Sec. 16: Lots 1 to 7 inclusive
Sec. 20: Lots 1 to 4 inclusive, and 6 to 10 inclusive
Sec. 30: Lot 2

Range 114
T. 16 N., R. 114 W.
Sec. 28: NW¼NW¼

T. 21 N., R. 114 W.
Sec. 25: Lots 1, 2, 3
Sec. 26: Lots 1, 2, 3, 4, 6, 7
Sec. 27: Lots 2, 3
Sec. 28: Lots 1, 2, 3, 4, 5, 6, 7, NE¼NW¼ N½NE¼

Range 115
T. 14 N., R. 115 W.
Sec. 20: SE¼SE¼
Sec. 22: SE¼NE¼, NE¼SW¼
Sec. 29: NE¼NW¼, E½E½

T. 15 N., R. 115 W.
Sec. 7: Lot 2
Sec. 31: SE¼NE¼

T. 16 N., R. 115 W.
Sec. 29: NW¼NE¼

T. 21 N., R. 115 W.
Sec. 18: SW¼NE¼, SE¼NW¼
Sec. 19: Lots 2 and 3, SE¼NW¼, NE¼SW¼

T. 25 N., R. 115 W.
Sec. 18: Lot 1

Range 116
T. 14 N., R. 116 W.
Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7, S½NE¼ SE¼NW¼, E½SW¼, SE¼
Sec. 17: NW¼NE¼
Sec. 21: SE¼SW¼
Sec. 29: Lot 1

T. 15 N., R. 116 W.
Sec. 8: Lots 5, 7, 8
Sec. 11: NW¼SE¼
Sec. 12: NW¼NE¼, SE¼NE¼, NE¼NW¼
Sec. 15: W½NE¼, E½NW¼, NE¼SW¼, NW¼SE¼
Sec. 16: NE¼, E½NW¼, SW¼NW¼
Sec. 20: Lots 5 to 8 inclusive
Sec. 21: NW¼NW¼
Sec. 22: NE¼SE¼
Sec. 23: SE¼SE¼
Sec. 25: N½NW¼, SW¼NW¼
Sec. 26: E½NE¼
Sec. 27: NW¼NW¼
Sec. 32: Lots 5 to 8 inclusive

T. 20 N., R. 116 W.
Sec. 4: Lot 1

Range 116 (Continued)
T. 21 N., R. 116 W.
Sec. 17: Tracts 98A, 98B, 98C, 98D
Sec. 24: Lots 3, 4, 5, 6, 7, 8
Sec. 25: Lots 1, 2, 4, 5

T. 22 N., R. 116 W.
Sec. 11: Tract 62, Lots 7, 10, 15, 21, Tract 57, Lot 20
Sec. 13: Lots 19, 20
Sec. 14: Tract 57, Lots 4, 9
Sec. 24: Lot 11

T. 23 N., R. 116 W.
Sec. 25: Lot 2, SW¼NE¼, SE¼NW¼, NW¼SE¼
Sec. 26: Lot 2
Sec. 35: NW¼NW¼

T. 25 N., R. 116 W.
Sec. 1: Lots 6, 7, 8

Range 117
Sec. 4: Lots 2, 3, 4, SW¼NE¼, S½NW¼
Sec. 6: Lot 1, SE¼NE¼, NE¼SE¼
Sec. 8: SE¼NE¼, SE¼

T. 14 N., R. 117 W.
Sec. 2: Lots 1, 2, 3, 4, S½N½, S½
Sec. 4: Lots 3, 4, S½NW¼, E½SE¼, SW¼SE¼
Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7, S½NE¼ SE¼NW¼, E½SW¼, SE¼
Sec. 10: All
Sec. 12: N½
Sec. 20: E½
Sec. 24: All
Sec. 26: All
Sec. 28: All
Sec. 30: E½SE¼

T. 15 N., R. 117 W.
Sec. 8: All
Sec. 12: NW¼, W½SW¼
Sec. 14: W½
Sec. 18: Lots 1, 2, 3, 4, E½W½, E½
Sec. 20: All
Sec. 22: All
Sec. 24: N½N½, S½S½
Sec. 26: All
Sec. 28: W½W½
Sec. 30: Lots 1, 2, 3, 4, E½, E½W½
Sec. 32: S½
Sec. 34: All

Range 117 (Continued)
T. 22 N., R. 117 W.
Sec. 1: Lots 9, 10, 11
Sec. 12: Lot 1

T. 23 N., R. 117 W.
Sec. 3: Lots 7, 10
Sec. 15: Lot 4
Sec. 22: E½SW¼, NW¼SE¼

T. 24 N. R. 117 W.
Sec. 2: Lots 6, 8, 9, 13, 16, 17, 18, 19
Sec. 3: Lots 5, 6, 7, 8
Sec. 4: Lots 5, 10, 12, 13
Sec. 10: Lot 1
Sec. 30: Lots 6, 7, 9, 15
Sec. 35: Lot 7

Range 118
T. 13 N., R. 118 W.
Sec. 4: Lots 3, 4, S½NW¼, SW¼
Sec. 6: Lots 3, 4, 5, 6
Sec. 8: NE¼, SW¼SW¼, N½SE¼, SE¼SE¼
Sec. 10: All
Sec. 14: E½, W½W½
Sec. 18: E½, W½W½
Sec. 20: E½
Sec. 32: SW¼

T. 14 N., R. 118 W.
Sec. 2: Lots 1, 2, 3, 4, S½N½, S½
Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7 S½NE¼, SE¼NW¼, E½SW¼, SE¼
Sec. 8: W½E½, NW¼, S½SW¼
Sec. 12: N½N½, SW¼NW¼
Sec. 18: Lots 1, 2, 3, 4, NE¼, E½W½
Sec. 20: All
Sec. 28: All
Sec. 30: N½, SW¼, W½SE¼, SE¼SE¼

T. 15 N., R. 118 W.
Sec. 4: Lots 1, 4, SE¼NE¼, SW¼NW¼, S½
Sec. 10: N½NE¼, W½, S½SE¼
Sec. 12: SE¼NW¼, SE¼
Sec. 14: NW¼
Sec. 18: Lots 1, 2, 3, E½, E½NW¼, NE¼SW¼
Sec. 20: All
Sec. 22: NE¼, W½
Sec. 30: E½E½
Sec. 32: All
Sec. 34: NE¼SE¼, S½SE¼

T. 24 N., R. 118 W.
Sec. 30: Lot 7

Range 119

T. 12 N., R. 119 W.
Sec. 2: Lot 1, SE¼NE¼, E½SE¼
Sec. 12: W½W½
Sec. 14: E½E½
Sec. 20: Lot 4
Sec. 24: Lot 4, NW¼SW¼, W½NW¼

T. 13 N., R. 119 W.
Sec. 2: Lots 1, 2, S½NE¼, SE¼SE¼
Sec. 6: S½SE¼
Sec. 8: W½, W½E½
Sec. 24: W½W½
Sec. 32: SW¼

T. 14 N., R. 119 W.
Sec. 4: Lots 1, 2, 3, 4, S½N½, S½
Sec. 6: Lots 6, 7, E½SW¼, SE¼
Sec. 8: N½, ~~SE¼~~ (SOLD)
Sec. 10: E½E½, NW¼NE¼, N½NW¼, SW¼SE¼
Sec. 12: W½W½
Sec. 14: All
Sec. 20: E½E½
Sec. 22: All
Sec. 24: All
Sec. 26: All
Sec. 28: N½, N½S½
Sec. 35: Lots 9, 10, 11

T. 15 N., R. 119 W.
Sec. 12: All
Sec. 14: All,
Sec. 24: SW¼
Sec. 26: All
Sec. 32: N½NE¼, W½, E½SE¼

T. 19 N., R. 119 W.
Sec. 28: N½SE¼
Sec. 34: NE¼NW¼

T. 22 N., R. 119 W.
Sec. 8: Lot 31
Sec. 17: S½, NW¼NE¼, S½, N½NW¼, Tract 40, Lots 6, 7, 8

T. 24 N., R. 119 W.
Sec. 1: Tract 98, Lots 6, 16
Sec. 2: Tract 98. Lots 5, 20, 38
Sec. 3: Lots 36, 38, 40, 45, SE¼SW¼ SW¼SE¼, Tract 94, Lots 35, 44
Sec. 4: Lots 36, 37, 40, 45, Tract 91, Lots 28, 29, 41, 42, 46, 52, Tract 94, Lots 43, 44
Sec. 9: Lots 1, 4, 18, 19, 30, 31, SE¼NE¼, NE¼SE¼, Tract 91, Lots 2, 3, 6
Sec. 10: Lot 1, NW¼, N½SW¼, SE¼SW¼, S½SE¼

Range 119 (Continued)

Sec. 11: SW¼SW¼
Sec. 14: Lot 9, W½NW¼
Sec. 15: Lots 1, 4, 5, 8, NE¼, E½W½, N½SE¼
Sec. 16: Lot 23
Sec. 19: Lots 7, 8,, E½SW¼
Sec. 20: Lot 28
Sec. 21: Lots 1, 19
Sec. 22: Lots 1, 2, N½NW¼, SW¼NW¼
Sec. 24: Lots 10, 11, 12, SW¼SW¼
Sec. 25: Lots 3, 27, 28, 29, 30, N½NW¼, SE¼NW¼, NW¼SW¼
Sec. 26: Lots 11, 14, 15, 16, 17, 18, 19
Sec. 29: Lots 6, 21
Sec. 35: Lots 1, 4, 6, 26, 27, NE¼NW¼
Sec. 36: Lots 5, 6

T. 25 N., R. 119 W.
Sec. 6: Lots 25, 26
Sec. 22: Tract 75, Lots 16, 26, Lot 27
Sec. 27: Lot 4
Sec. 29: Lots 26, 27, Tract 52, Lots 21, 23, 25, 28, 29, 31
Sec. 30: Lots 20, 25, Tract 52, Lot 26
Sec. 32: Tract 52, Lot 6

T. 27 N., R. 119 W.
Sec. 18: W½W½, SW¼SE¼
Sec. 19: W½W½, E½

Range 120

T. 14 N., R. 120 W.
Sec. 4: Lots 1 to 4 inclusive, S½N½,
Sec. 8: S½
Sec. 10: E½E½, NW¼NE¼, NW¼, SW¼SE¼
Sec. 14: All
Sec. 20: All
Sec. 24: N½, SW¼
Sec. 26: NE¼NE¼, E½SE¼
Sec. 28: S½
Sec. 30: S½N½, S½

T. 15 N., R. 120 W.
Sec. 10: W½NW¼

T. 22 N., R. 120 W.
Sec. 15: Lot 4

T. 23 N., R. 120 W.
Sec. 25: Lot 28
Sec. 36: Lot 23, 24, 25, 26

T. 24 N., R. 120 W.
Sec. 1: Lots 45, 46

Range 121
T. 13 N., R. 121 W.
Sec. 2: Lot 1
Sec. 10: Lots 2, 3
Sec. 12: NE¼NE¼
Sec. 24: NW¼SE¼

T. 14 N., R. 121 W.
Sec. 12: NW¼NW¼
Sec. 24: S½SE¼
Sec. 26: NE¼, SE¼NW¼, S½S½

Range 121 (Continued)
T. 15 N., R. 121 W.
Sec. 2: Lots 1, 2, S½NE¼, SE¼
Sec. 11: E½
Sec. 14: N½NE¼, SW¼NE¼, N½SE¼SE¼
Sec. 23: E½
Sec. 34: Lots 1 to 4 inclusive

T. 16 N., R. 121 W.
Sec. 23: E½
Sec. 26: SE¼
Sec. 35: E½

STAR VALLEY AREA

Range 118
T. 30 N., R. 118 W.
Sec. 5: Lot 4
Sec. 21: Lot 1
Sec. 28: Lot 1, E½NE¼, NE¼SE¼
Sec. 33: Lot 1, SE¼NE¼, E½SE¼

T. 31 N., R. 118 W.
Sec. 18: Lots 1, 2, 3, 4, W½NE¼
Sec. 19: Lot 1

T. 32 N., R. 118 W.
Sec. 31: E½NE¼, NE¼SE¼

T. 33 N., R. 118 W.
Sec. 11: E½NW¼
Sec. 28: E½SW¼

T. 34 N., R. 118 W.
Sec. 5: Lots 1, 5, 6, 9
Sec. 6: SE¼NE¼
Sec. 27: Lots 2, 3
Sec. 28: E½NE¼

Range 119
T. 30 N., 119 W.
Sec. 2: NE¼SE¼
Sec. 11: S½NE¼, NW¼
Sec. 12: SW¼NW¼, NW¼SW¼

T. 31 N., R. 119 W.
Sec. 6: Lots 4, 5, 6
Sec. 7: Lots 1,4
Sec. 8: Lots 7, 8, SE¼SE¼
Sec. 9: SW¼SW¼
Sec. 17: Lot 7
Sec. 18: Lot 8 (reconveyed U.S.)
Sec. 21: W½SW¼

T. 33 N., R. 119 W.
Sec. 2: Lot 2, SE¼NE¼
Sec. 33: Lots 1, 2, 3, 4

T. 34 N., R. 119 W.
Sec. 22: Lots 3, 4, 5,
Sec. 35: Lots 1, 2, 3, 8, 9, NE¼SW¼

T. 36 N., R. 119 W.
Sec. 14: SE¼NE¼, N½SE¼
Sec. 24: E½E½
Sec. 25: NE¼NE¼, S½NE¼, SE¼

Lands Identified for Potential Disposal Under Alternative D (Preferred Alternative)

Range 110
T. 18 N., R. 110 W.
Sec. 10: NE¼SW¼

Range 111
T. 18 N., R. 111 W.
Sec. 16: All

Range 114
T. 16 N., R. 114 W.
Sec. 28: NW¼NW¼
T. 21 N., R. 114 W.
Sec. 22: SE¼

Range 115
T. 14 N., R. 115 W.
Sec. 20: SE¼SE¼
Sec. 22: SE¼NE¼, NE¼SW¼
Sec. 29: NE¼NW¼, E½E½

T. 15 N., R. 115 W.
Sec. 7: Lot 2
Sec. 31, SE¼NE¼

Range 116
T. 14 N., R. 116 W.
Sec. 17: NW¼NE¼
Sec. 21: SE¼SW¼
Sec. 29: Lot 1

T. 15 N., R. 116 W.
Sec. 8: Lots 5, 7, 8
Sec. 20: Lots 5 to 8 inclusive
Sec. 21: NW¼NW¼
Sec. 22: NE¼SE¼
Sec. 23: SE¼SE¼
Sec. 25: N½NW¼, SW¼NW¼
Sec. 26: E½NE¼
Sec. 27: NW¼NW¼
Sec. 32: Lots 5 to 8 inclusive

T. 20 N., R. 116 W.
Sec. 4: Lot 1
Sec. 6: Lots 1, 2, 3, 4, 5, 6, E½SW¼, SE¼
Sec. 18: Lots 1, 2, 3, 4, E½, E½W½
Sec. 19: Lots 1, 2, 3, 4, NE¼NW¼, SE¼SW¼
Sec. 30: Lots 1, 2, 3, 4, E½, E½W½

T. 21 N., R. 116 W.
Sec. 11: Tract 68, lots 11, 17, 18, 19
Sec. 14: Tract 57, lots 1, 2, 3
Sec. 17: Tracts 98A, 98B, 98C, 98D
Sec. 19: Lots 5, 6, 7, 8, 9, 10, W½NW¼
Sec. 22: NE¼, NE¼SE¼

Range 116 (Continued)
T. 21 N., R. 116 W.
Sec. 27: E½NW¼, E½
Sec. 28: SE¼NE¼, E½SE¼
Sec. 30: Lots 5, 6, 7, 8, 9, 10, SW¼
Sec. 31: Lots 5, 6, 7, 8, 9, 10, 11, NW¼NW¼, SW¼SW¼
Sec. 33: Lot 1, N½NE¼NE¼, N½SW¼NE¼NE¼, SE¼SW¼NE¼NE¼, SE¼NE¼NE¼, N½NE¼SE¼NE¼, NW¼NE¼NE¼SE¼, S½N½NE¼SE¼, S½NE¼SE¼
Sec. 34: N½, E½SW¼, SE¼

T. 21 N., R. 116 W.
Sec. 35: lots 3, 4, 5, 6
Sec. 36: lots 4, 5

T. 23 N., R. 116 W.
Sec. 35: lot 11

T. 25 N., R. 116 W.
Sec. 1: Lots 6, 7, 8, SW¼NE¼, SE¼NW¼, SE¼SW¼
Sec. 2: Lots 5, 6, 7, 8, S½NW¼, SW¼

Range 117
T. 13 N., R. 117 W.,
Sec. 4: Lots 2, 3, 4, SW¼NE¼, S½NW¼, N½SW¼
Sec. 6: Lot 1, SE¼NE¼, NE¼SE¼
Sec. 8: SE¼NE¼, SE¼

T. 14 N., R. 117 W.,
Sec. 30: E½SE¼

T. 20 N., R. 117 W.
Sec. 3: SW¼
Sec. 4: Lot 1, E½SE¼
Sec. 9: E½NE¼, NE¼SE¼, S½SE¼
Sec. 10: W½
Sec. 15: SW¼
Sec. 21: N½NE¼
Sec. 22: W½, SE¼
Sec. 24: All
Sec. 26: All
Sec. 34: All

Range 118
T. 13 N., R. 118 W.,
Sec. 4: Lots 3, 4, S½NW¼, SW¼
Sec. 6: Lots 3, 4, 5, 6
Sec. 8: NE¼, SW¼SW¼, N½SE¼, SE¼SE¼
Sec. 10: All

Range 118 (Continued)
Sec. 14: E½, W½W½
Sec. 18: E½, E½W½
Sec. 20: E½

T. 13 N., R. 118 W.,
Sec. 32: SW¼

T. 14 N., R. 118 W.,
Sec. 2: Lots 1, 2, 3, 4, S½N½, S½
Sec. 6: Lots 1, 2, 3, 4, 5, 6, 7, S½NE¼, SE¼NW¼, E½SW¼, SE¼
Sec. 8: W½E½, NW¼, S½SW¼
Sec. 12: N½N½, SW¼NW¼
Sec. 18: Lots 1, 2, 3, 4, NE¼, E½W½
Sec. 20: All
Sec. 22: All
Sec. 28: All
Sec. 30: N½, SW¼, W½SE¼, SE¼SE¼
Sec. 34: All

T. 15 N., R. 118 W.,
Sec. 30: E½E½

T. 30 N., R. 118 W.
Sec. 21: Lot 1
Sec. 28: Lot 1, E½NE¼, NE¼SE¼
Sec. 33: Lot 1, SE¼NE¼, E½SE¼

Range 119
T. 12 N., R. 119 W.
Sec. 2: Lot 1, SE¼NE¼, E½SE¼
Sec. 12: W½W½
Sec. 14: E½E½
Sec. 20: Lot 4
Sec. 24: Lot 4, NW¼SW¼, W½NW¼

T. 13 N., R. 119 W.
Sec. 2: Lots 1, 2, S½NE¼, SE¼SE¼
Sec. 6: S½SE¼
Sec. 8: W½, W½E½
Sec. 24: W½W½
Sec. 32: SW¼

T. 14 N., R. 119 W.
Sec. 4: Lots 1, 2, 3, 4, S½N½, S½
Sec. 6: Lots 6, 7, E½SW¼, SE¼
Sec. 8: N½
Sec. 10: E½E½, NW¼NE¼, N½NW¼, SW¼SE¼
Sec. 12: W½W½
Sec. 14: All
Sec. 20: E½E½
Sec. 22: All
Sec. 24: All
Sec. 26: All
Sec. 28: N½, N½S½
Sec. 35: Lots 9, 10, 11

Range 119 (Continued)
T. 15 N., R. 119 W.
Sec. 24: SW¼
Sec. 26: SW¼
Sec. 32: N½NE¼, W½, E½SE¼

T. 18 N., R. 119 W.
Sec. 6: All

T. 30 N., R. 119 W.,
Sec. 2: NE¼SE¼
Sec. 11: S½NE¼, NW¼
Sec. 12: SW¼NW¼, NW¼SW¼

T. 33 N., R. 119 W.
Sec. 2: Lot 2, SE¼NE¼
Sec. 33: Lots 1, 2, 3, 4

T. 36 N., R. 119 W.
Sec. 14: SE¼NE¼, N½SE¼
Sec. 24: E½E½
Sec. 25: NE¼N¼, S½NE¼, SE¼

Range 120
T. 14 N., R. 120 W.
Sec. 4: Lots 1 to 4 inclusive, S½N½, S½
Sec. 8: S½
Sec. 10: E½E½, NW¼NE¼, NW¼, SW¼SE¼
Sec. 14: All
Sec. 20: All
Sec 24: N½, SW¼
Sec. 26: NE¼NE¼, E½SE¼
Sec. 28: S½
Sec. 30: S½N½, S½

Range 121
T. 13 N., R. 121 W.
Sec. 2: Lot 1
Sec. 10: Lots 2, 3
Sec. 12: NE¼NE¼
Sec. 24: NW¼SE¼

T. 14 N., R. 121 W.
Sec. 12: NW¼NW¼
Sec. 24: S½SE¼
Sec. 26: NE¼, SE¼NW¼, S½S½

T. 15 N., R. 121 W.
Sec. 2: Lots 1, 2, S½NE¼, SE¼
Sec. 11: E½
Sec. 14: N½NE¼, SW¼NE¼, N½SE¼SE¼
Sec. 23: E½
Sec. 34: Lots 1 to 4 inclusive

T. 16 N., R. 121 W.
Sec. 23: E½
Sec. 26: SE¼
Sec. 35: E½

STAR VALLEY AREA

Range 118
T. 30 N., R. 118 W.
Sec. 5: Lot 4

T. 31 N., R. 118 W.
Sec. 18: Lots 1, 2, 3, 4, W½NE¼
Sec. 19: Lot 1

T. 32 N., R. 118 W.
Sec. 31: E½NE¼, NE¼SE¼

T. 33 N., R. 118 W.
Sec. 11: E½NW¼
Sec. 28: E½SW¼

T. 34 N., R. 118 W.
Sec. 5: Lots 1, 5, 6, 9
Sec. 6: SE¼NE¼
Sec. 27: Lots 2, 3
Sec. 28: E½NE¼

Range 119
T. 30 N., 119 W.
Sec. 2: NE¼SE¼

T. 31 N., R. 119 W.
Sec. 6: Lots 4, 5, 6
Sec. 7: Lots 1, 4
Sec. 8: Lots 7, 8, SE¼SE¼
Sec. 9: SW¼SW¼
Sec. 17: Lot 7
Sec. 18: Lot 8 (reconveyed U.S.)
Sec. 20: E½SE¼
Sec. 21: W½SW¼

T. 34 N., R. 119 W.
Sec. 22: Lots 3, 4, 5
Sec. 35: Lots 1, 2, 3, 8, 9, NE¼SW¼

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KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX H

Standard Oil and Gas Stipulations

Appendix H
Standard Oil and Gas Stipulations

Multiple Mineral Development Stipulation

Operations will not be approved which, in the opinion of the authorized officer, would unreasonably interfere with the orderly development and (or) production from a valid existing mineral lease issued prior to this one for the same lands.

Lease Notice 1

Under Regulation 43 Code of Federal Regulation (CFR) 3101.1 2 and terms of the lease (Bureau of Land Management [BLM] Form 3100 11), the authorized officer may require reasonable measures to minimize adverse impacts to other resource values, land uses, and users not addressed in lease stipulations at the time operations are proposed. Such reasonable measures may include, but are not limited to, modification of siting or design of facilities, timing of operations, and specification of interim and final reclamation measures, which may require relocating proposed operations up to 200 meters, but not off the leasehold, and prohibiting surface-disturbance activities for up to 60 days.

The lands within this lease may include areas not specifically addressed by lease stipulations that may contain special values, may be needed for special purposes, or may require special attention to prevent damage to surface and (or) other resources. Possible special areas are identified below. Any surface use or occupancy within such special areas will be strictly controlled or, if absolutely necessary, prohibited. Appropriate modifications to imposed restrictions will be made for the maintenance and operation of producing wells.

1. Slopes in excess of 25 percent.
2. Within 500 feet of surface water and (or) riparian areas.
3. Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.
4. Within 500 feet of Interstate highways and 200 feet of other existing rights of way (i.e., U.S. and state highways, roads, railroads, pipelines, powerlines).
5. Within ¼ mile of occupied dwellings.
6. Material sites.

Guidance

The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when one or more of the above conditions exist, surface-disturbing activities will be prohibited unless or until the permittee or the designated representative and the surface management agency arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action.

Specific threshold criteria (e.g., 500 feet from water) have been established based on the best information available. However, geographical areas and time periods of concern must be delineated at the field level (i.e., "surface water and (or) riparian areas" may include both intermittent and ephemeral water sources or may be limited to perennial surface water).

The referenced oil and gas leases on these lands are hereby made subject to the stipulation that the exploration or drilling activities will not interfere materially with the use of the area as a materials site/free use permit. At the time operations on the above lands are commenced, notification will be made to the appropriate agency. The name of the appropriate agency may be obtained from the respective BLM field office.

Lease Notice 2

Background

The BLM, by including National Historic Trails (NHTs) within its National Landscape Conservation System, has recognized these trails as national treasures. The BLM's responsibility is to review the strategy for management, protection, and preservation of these trails. The NHTs in Wyoming, which include the Oregon, California, Mormon Pioneer, and Pony Express Trails, as well as the Nez Perce Trail, were designated by Congress through the National Trails System Act (Public Law [P.L.] 90-543; 16 United States Code [USC] 1241-1251) as amended through P.L. 106-509 dated November 13, 2000. Protection of the NHTs is normally considered under the National Historic Preservation Act (P.L. 89-665; 16 USC 470 et seq.) as amended through 1992 and the National Trails System Act. Additionally, Executive Order 13195, "Trails for America in the 21st Century," signed January 18, 2001, states in Section 1: "Federal agencies will...protect, connect, promote, and assist trails of all types throughout the United States. This will be accomplished by…(b) Protecting the trail corridors associated with national scenic trails and the high priority potential sites and segments of national historic trails to the degrees necessary to ensure that the values for which each trail was established remain intact." Therefore, the BLM will be considering all impacts and intrusions to the NHTs, their associated historic landscapes, and all associated features, such as trail traces, grave sites, historic encampments, inscriptions, natural features frequently commented on by emigrants in journals, letters and diaries, or any other feature contributing to the historic significance of the trails. Additional NHTs will likely be designated amending the National Trails System Act. When these amendments occur, this notice will apply to those newly designated NHTs as well.

Strategy

The BLM will proceed in this objective by conducting a viewshed analysis on either side of the designated centerline of the NHTs in Wyoming, except, at this time, for the Nez Perce Trail, for the purpose of identifying and evaluating potential impacts to the trails, their associated historic landscapes, and their associated historic features. Subject to the viewshed analysis and archeological inventory, reasonable mitigation measures may be applied. These may include, but are not limited to, modification of siting or design of facilities to camouflage or otherwise hide the proposed operations within the viewshed. Additionally, specification of interim and final reclamation measures may require relocating the proposed operations within the leasehold. Surface-disturbing activities will be analyzed in accordance with the National Environmental Policy Act of 1969 (P.L. 91-190; 42 USC 4321-4347) as amended through P.L. 94-52, July 3, 1975, and P.L. 94-83, August 9, 1975, and the National Historic Preservation Act, supra, to determine if any design, siting, timing, or reclamation requirements are necessary). This strategy is necessary until the BLM determines that, based on the results of the completed viewshed analysis and archeological inventory, the existing land use plans (Resource Management Plans) have to be amended.

The use of this lease notice is a predecisional action that is necessary until final decisions regarding surface-disturbing restrictions are made. Final decisions regarding surface-disturbing restrictions will take place with full public disclosure and public involvement over the next several years if BLM determines that it is necessary to amend existing land use plans.

Guidance

The intent of this notice is to inform interested parties (potential lessees, permittees, operators) that when any oil and gas lease contains remnants of NHTs, or is located within the viewshed of an NHTs' designated centerline, surface-disturbing activities will require the lessee, permittee, operator or their designated representative, and the surface management agency to arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development and become a condition for approval when authorizing the action.

Attachment to Each Lease

Notice to Lessee

Provisions of the Mineral Leasing Act (MLA) of 1920, as amended by the Federal Coal Leasing Amendments Act of 1976, affect an entity's qualifications to obtain an oil and gas lease. Section 2(a)(2)(A) of the MLA, 30 USC 201 (a)(2)(A), requires that any entity that holds and has held a federal coal lease for 10 years beginning on or after August 4, 1976, and who is not producing coal in commercial quantities from each such lease, cannot qualify for the issuance of any other lease granted under the MLA. Compliance by coal lessees with Section 2(a)(2)(A) is explained in 43 CFR 3472.

In accordance with the terms of this oil and gas lease, with respect to compliance by the initial lessee with qualifications concerning federal coal lease holdings, all assignees and transferees are hereby notified that this oil and gas lease is subject to cancellation if (1) the initial lessee as assignor or as transferor has falsely certified compliance with Section 2(a)(2)(A), or (2) because of a denial or disapproval by a state office of a pending coal action; i.e., arms-length assignment, relinquishment, or logical mining unit, or the initial lessee as assignor or as transferor is no longer in compliance with Section 2(a)(2)(A). The assignee, sublessee, or transferee does not qualify as a bona fide purchaser and, thus, has no rights to bona fide purchaser protection in the event of cancellation of this lease due to noncompliance with Section 2(a)(2)(A).

Information regarding assignor, sublessor, or transferor compliance with Section 2(a)(2)(A) is contained in the lease case file, as well as in other BLM records available through the state office issuing this lease.

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KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX I

Recreation and Travel Management

APPENDIX I
RECREATION AND TRAVEL MANAGEMENT

1.0 Recreation Matrices

The following tables summarize the proposed Recreation Management Areas in the Kemmerer planning area. Special Recreation Management Areas (SMRAs) are Bureau of Land Management (BLM) administrative units established to direct recreation program priorities, including the allocation of funding and personnel, to those public lands where a commitment has been made to provide specific recreation activity and experience opportunities on a sustained yield basis. This includes a long-term commitment to manage the physical, social, and managerial settings to sustain these activity and experience opportunities. Delineation is based on administrative/management criteria including the existence of Congressional designations, similar or interdependent recreation values, homogenous or interrelated recreation uses, land-tenure and use patterns, transportation systems, administrative efficiency, intensity of use, high resource values, public concerns, or interagency considerations. These areas usually require a high level of recreation investment and (or) management. They include recreation sites, but recreation sites alone do not constitute a SRMA.

Pine Creek Canyon
Special Recreation Management Area

Primary Market Strategy	Market
Community	Primarily Local Residents

Niche
Camping, picnicking, hiking, snowmobiling, and driving for pleasure

Recreation Management Objective
To provide opportunities for visitors to engage in targeted activities to achieve experiences and benefits as indicated below. Maintain setting character as outlined below.

Targeted Outcomes		
Primary Activities	**Experiences**	**Benefits**
Picnicking Camping Driving for Pleasure Snowmobiling Hiking	Being with friends & family Relaxing physically Enjoying scenery & natural setting Enjoying leisure activities	**Personal:** • Nature/aesthetic appreciation • Positive change in mood and emotion • Social bonding/cohesion/cooperation • Identification with a special place **Community** • Improved perceived quality of life • Family bonding/better family life • Improved image of the area and its recreational opportunities • Improved image of land management agencies **Environmental:** • Creates sense of "ownership" and stewardship of the area • Better preservation of forest & riparian environment **Economic:** • Contribution to Recreation & Tourism Sector of the local economy • Retains recreation spending in local area • Increased attractiveness of Wyoming as a place to relocate

Prescribed Setting Character		
Physical	**Social**	**Administrative**
Remoteness: Front Country (near improved roads) **Naturalness:** Middle Country (natural appearing landscapes) **Facilities:** Middle Country (Developed recreation facilities designed to facilitate access & use of the area)	**Contacts:** Middle/Front Country (2-7 encounters/day. **Group Size:** Back Country (4-6 people per group) **Evidence of Use:** Front Country (Vehicle tracks common, some noise & litter, vegetation commonly worn around public facilities)	**Mechanized Use:** Front Country (Two & four wheel drive vehicles, ATV snow machines & non-motorized/mechanized travel) **Visitor Services:** Front Country (Regulatory/information signs, OHV limitations) **Management:** Front Country (Information materials available at developed sites. Agency personnel occasionally onsite, occasional regulatory signing, periodic enforcement presence)

Implementation Strategy/Actions	
Administrative	Maintain facilities as they currently exist. Snowmobiling will be managed according to the Pine Creek Snowmobile EA, completed in 2004. SRPs will be evaluated for recreation/outdoor education and for commercial activities for qualified hunting guides. On developed recreation sites, unless specifically authorized, no person shall discharge firearms, other weapons, projectiles, or fireworks. The Pine Creek SRMA would be managed as VRM Class II; OHV – Motor vehicles limited to designated roads & trails.
Management	Campground fees may be charged in the future. Current facilities include one bathroom and several campsites. Snowmobiling is restricted to Pine Creek Road. The development of new facilities will be evaluated as demand dictates.
Marketing	Support active volunteer programs and develop new partnerships (e.g., National Public Lands Day and National Trails Day events and volunteer projects for local groups).
Monitoring	Routine monitoring of physical facilities, visitor number collections will continue to include a counter, and periodic visitor surveys will assess achievement of management objectives.

Raymond Mountain Wilderness Study Area
Special Recreation Management Area

<table>
<tr><th colspan="2">Primary Market Strategy</th><th>Market</th></tr>
<tr><td colspan="2">Destination and Community</td><td>Visitors and Local Residents</td></tr>
<tr><td colspan="3">Raymond Mountain Wilderness Study Area SRMA: Back Country Zone</td></tr>
<tr><th colspan="3">Niche</th></tr>
<tr><td colspan="3">Primarily Hunting, Back Packing, Hiking, Primitive Camping, Trailhead Facilities, Access Point to Raymond WSA</td></tr>
<tr><th colspan="3">Recreation Management Objective</th></tr>
<tr><td colspan="3">Manage this Back Country Zone to provide high quality hiking, back packing and hunting along with informational trailhead facilities at the access point to Raymond Mountain WSA to provide targeted experiences and benefits. Maintain setting character as outlined below.</td></tr>
<tr><th colspan="3">Targeted Outcomes</th></tr>
<tr><th>Primary Activities</th><th>Experiences</th><th>Benefits</th></tr>
<tr><td>Trailhead for Back Country and Access to Raymond Mountain WSA
Hunting
Primitive Camping
Picnicking/Day Use
Viewing Wildlife/Natural Scenery
Limited Mountain Biking
Rock Climbing</td><td>Enjoying viewing natural scenery
Relaxing physically
Engaging in preferred activities with family & friends</td><td>Personal:
• Nature/aesthetic appreciation
• Positive change in mood and emotion
• Social bonding/cohesion/cooperation
• Personal health & fitness
Community:
• Improved perceived quality of life
• Family bonding/better family life
• Better appreciation of Raymond Mountain WSA
• Improved image of land management agencies
Environmental:
• Public learns environmental stewardship
• Better preservation of Raymond Mountain WSA
Economic:
• Contribution to Recreation & Tourism Sector of the local economy</td></tr>
<tr><th colspan="3">Prescribed Setting Character</th></tr>
<tr><th>Physical</th><th>Social</th><th>Administrative</th></tr>
<tr><td>Remoteness: Back Country
Naturalness: Back Country
Facilities: Back Country</td><td>Contacts: Back Country
Group Size: Back Country
Evidence of Use: Back Country
Types of Encounters: Front Country</td><td>Mechanized Use: Back Country
Visitor Services: Back Country
Management Controls: Middle Country
Domestic Animals: Middle Country</td></tr>
<tr><th colspan="3">Implementation Strategy/Actions</th></tr>
<tr><td>Administrative</td><td colspan="2">Maintain trails</td></tr>
<tr><td>Management</td><td colspan="2">Continue to manage WSA under IMP, Closed to OHV, VRM Class I</td></tr>
<tr><td>Marketing</td><td colspan="2">Word of mouth only</td></tr>
<tr><td>Monitoring</td><td colspan="2">Routine monitoring of trails and use; occasional visitor contact to assess achievement of objectives</td></tr>
</table>

Oregon-California National Historic Trails
Special Recreation Management Area

Includes Oregon and California National Historic Trails

Primary Market Strategy	Market
Destination and Community	Local Residents and National and International and Visitors

Niche
Historic Preservation, Education/Interpretation

Recreation Management Objective
Manage the Oregon-California National Historic Trails SRMA to provide opportunities for visitors to engage in targeted activities in preferred settings to achieve experiences & benefits indicated below. Preserve the physical remains of historic trails and, where possible, the physical setting in which the trails are located.

Targeted Outcomes		
Primary Activities	**Experiences**	**Benefits**
Driving/Touring for Pleasure Viewing Historic Sites Learning about the History of the Area Living History Heritage Education and Tourism	Viewing historic trail remains in a natural setting Studying and learning about the history of the area Engaging in preferred activities with family & friends Feeling good about the way our cultural heritage is being protected & interpreted	**Personal:** • Nature/aesthetic/historic appreciation • Greater respect for cultural heritage • Social bonding/cohesion/cooperation • Identification with a special place • Better understanding of pioneer's contribution to our way of life **Community:** • Improved perceived quality of life • Improved image of the area and its history **Environmental:** • Creates sense of ownership and stewardship of cultural/historical resources of the area • Greater protection of the area's cultural/historical resources **Economic:** • Contribution to Recreation & Tourism Sector of the local economy • Retains recreation spending in local area • Increased attractiveness of Wyoming as a place to live

Prescribed Setting Character		
Physical	**Social**	**Administrative**
The setting prescriptions below are generalized and apply broadly to the entire Historic Trail Corridor. The physical, social, and administrative settings vary from middle country to rural. Middle country settings are found north of Kemmerer in places such as Dempsey Ridge. Rural Settings are found nearer gas fields and towns.		
Remoteness: Middle Country – Rural (on and near roads & developments) **Naturalness:** Middle Country - Rural (natural appearing – developed landscapes) **Facilities:** Middle Country – Rural (maintained roads, interpretive signage, campgrounds)	**Contacts:** Middle - Rural **Group Size:** Middle Country - Rural **Evidence of Use:** Middle Country - Rural	**Mechanized Use:** Middle Country Visitor Services: Middle Country **Visitor Services:** Middle Country - Rural **Management Controls:** Middle Country

Implementation Strategy/Actions	
Administrative	Encourage and develop cooperative partnerships with volunteer groups, land owners and other land management agencies to facilitate responsible recreational use of the area. SRPs may be allowed for commercial, non-commercial, and competitive events on a case-by-case basis.
Management	Maintain integrity of setting for significant and appropriate trail segments. Developments such as access/interpretation would be authorized as needed. Revise statewide Historic Trails Management Plan. Manage Trail corridor as VRM Class II in Foreground - Middleground Zone depending on visibility analyses for proposed actions. NSO for fluid minerals ¼ mile either side of trail remains or visual horizon, whichever is less.
Marketing	Information/directional signs and interpretation along the corridor, as appropriate. Develop brochures for the area and upgrade the Internet site that describes the area.
Monitoring	Monitor condition of trail segments and associated sites every 2 years or as appropriate. Monitor visitor use registration forms and periodic visitor surveys to assess achievement of management objectives.

Dempsey Ridge Special Recreation Management Area and Emigrant Springs Scenic Back Country Byway

Primary Market Strategy	Market
Destination/ Community	Residents and National and International Visitors

Niche
Driving/Touring for pleasure, Hunting, camping, historic interpretation

Recreation Management Objective
By 2010, manage this area to provide opportunities for visitors to engage in targeted activities, providing no less than 90 percent of visitors a realization of targeted benefits. Establish the Emigrant Springs Scenic Back Country Byway.

Targeted Outcomes		
Primary Activities	**Experiences**	**Benefits**
Driving/Touring for Pleasure Camping Hunting Viewing Wildlife/Natural Scenery Horseback Riding Heritage Tourism Visiting Historic Trails and Sites	Being with friends and family Enjoying natural scenery and wildlife Enjoying leisure activities in a natural setting Testing and improving driving skills Reestablishing connections to past	**Personal:** • Positive change in mood and emotion • Social bonding/cohesion/cooperation • Natural /aesthetic appreciation • Identification with special place **Community/Social:** • Improved perceived quality of life • Social bonding • Improved image of area and its recreational opportunities **Environmental:** • Creates sense of "ownership" and stewardship of the historic area • Provides natural habitat and open space **Economic:** • Retains recreation spending in local area • Increased contribution to the local economies • Increased attractiveness of Wyoming as a place to relocate

Prescribed Setting Character		
Physical	**Social**	**Administrative**
Remoteness: Middle Country (on and near four-wheel drive road) **Naturalness: Middle Country** (natural landscape except primitive road) **Facilities: Front Country** (maintained road, interpretive signage, fences around graves)	**Contacts: Primitive Country** (fewer than 3 encounters/day) **Group Size: Primitive Country** 2 to 4**Evidence of Use: Back Country** Noise and litter infrequent, Vegetation tramping near sites	**Mechanized Use:** Middle Country Four-wheel vehicles predominate, ATV and nonmotorized travel **Management :** Back Country Byway Signs at key access points, enforcement rare **Visitor Services:** Back Country Byway Basic maps but information rarely available on site

Implementation Strategy/Actions	
Administrative	Encourage and develop cooperative relationships with volunteer groups, landowners and other land management agencies to facilitate responsible recreational use of the area. SRP will be allowed for commercial, noncommercial and competitive on a case-by-case basis. Maintain the signs at both graves.
Management	Most of the area will be managed as VRM class II and NSO for fluid minerals within ¼ mile of trails. Maintain existing facilities include two graves and 20 miles of improved roads.
Marketing	Develop cooperative relationships with local groups, upgrade Internet site describing the site and continue to make brochures of the area available off site.
Monitoring	Routine monitoring of physical facilities, and trails, visitor number collections will continue to include registration forms; periodic visitor surveys to assess achievement of goals.

Remainder of the Kemmerer Planning Area
Recreation Management Zone

<table>
<tr><th>Primary Market Strategy</th><th colspan="2">Market</th></tr>
<tr><td>Destination and Community</td><td colspan="2">Local Residents and Visitors</td></tr>
<tr><th colspan="3">Niche</th></tr>
<tr><td colspan="3">Driving/Touring for Pleasure, Hunting, Camping, Fishing, Four-Wheeling</td></tr>
<tr><th colspan="3">Recreation Management Objective</th></tr>
<tr><td colspan="3">By 2010, manage this zone to provide opportunities for visitors to engage in targeted activities, providing no less than 70 percent of visitors a realization of targeted benefits.</td></tr>
<tr><th colspan="3">Targeted Outcomes</th></tr>
<tr><th>Primary Activities</th><th>Experiences</th><th>Benefits</th></tr>
<tr><td>Driving/Touring for pleasure
Camping
Hunting
Fishing
Viewing Wildlife/Natural Scenery
Horseback Riding
Cross-country Skiing
Four-Wheeling</td><td>Being with friends and family
Enjoying natural scenery and wildlife
Enjoying leisure activities in a natural setting
Testing and improving outdoor skills</td><td>Personal:
• Positive change in mood and emotion
• Social bonding/cohesion/cooperation
• Natural/aesthetic appreciation
• Identification with special place
Community/Social:
• Improved perceived quality of life
• Social bonding
• Improved image of area and its recreational opportunities
Environmental:
• Creates sense of ownership and stewardship of the area
• Provides natural habitat and open space
Economic:
• Retains recreation spending in local area
• Increased contribution to the local economies
• Increased attractiveness of Wyoming as a place to relocate</td></tr>
<tr><th colspan="3">Prescribed Setting Character</th></tr>
<tr><th>Physical</th><th>Social</th><th>Administrative</th></tr>
<tr><td>Remoteness: Primitive -Urban (mixed)
Naturalness: Primitive-Urban (mixed)
Facilities: Primitive-Urban (mixed)</td><td>Contacts: Primitive-Urban (ranges greatly)
Group Size: Primitive-Urban (ranges greatly)
Evidence of Use: Primitive-Urban (ranges greatly)</td><td>Mechanized Use: Primitive-Urban
All types of travel found
Management : Back-Front Country (ranges greatly)
Visitor Services: Back-Front Country (ranges greatly)</td></tr>
<tr><th colspan="3">Implementation Strategy/Actions</th></tr>
<tr><td>Administrative</td><td colspan="2">Work with private landowners and other land management agency to improve access. Allow for commercial, non-commercial and completive SRPs and would allow for competitive OHV trails events on a case-by-case basis.</td></tr>
<tr><td>Management</td><td colspan="2">Provide regulatory and interpretive signs where appropriate and funding allows.</td></tr>
<tr><td>Marketing</td><td colspan="2">Develop cooperative relationships with local groups, upgrade Internet site describing the area.</td></tr>
<tr><td>Monitoring</td><td colspan="2">Periodically review tourist's surveys completed by state and local groups, monitor access and recreational complaints.</td></tr>
</table>

2.0 Natural Resource Recreation Settings

Table I-1 represents a generalized conceptual framework of available recreation settings. Within the desired recreation setting, recreation management actions are prescribed to achieve targeted activities, experiences, and benefits.

Table I-1. Natural Resource Recreation Settings: Criteria for Classification and Prescriptions

	Primitive		Back Country	Middle Country	Front Country	Rural	Urban
	Pristine	Transition					
Physical – Resources & Facilities: ***Character of the natural landscape***							
a. **Remoteness**	More than 10 miles from any road	More than 3 miles from any road	More than ½ mile from any kind of road, but not as distant as 3 miles, and no road is in sight	On or near four-wheel drive roads, but at least ½ mile from all improved roads, though they may be in sight	On or near improved country roads, but at least ½ mile from all highways	On or near primary highways, but still within a rural area	On or near primary highways, municipal streets, and roads within towns or cities
b. **Naturalness**	Undisturbed natural landscape		Naturally appearing landscape having modifications not readily noticeable	Naturally appearing landscape, except for obvious primitive roads	Landscape partially modified by roads, utility lines, etc., but none overpower natural landscape features	Natural landscape substantially modified by agriculture or industrial development	Urbanized developments dominate this landscape
c. **Facilities**	None		Some primitive trails made of native materials, such as log bridges and carved wooden signs	Maintained and marked trails, simple trailhead developments, improved signs, and very basic toilets	Improved, yet modest, rustic facilities, such as campgrounds, restrooms, trails, and interpretive signs	Modern facilities, such as campgrounds, group shelters, boat launches, and occasional exhibits	Elaborate full-service facilities, such as laundry, groceries, and book stores
Social – Visitor Use & Users: ***Character of recreation and tourism use***							
d. **Group Size** (other than your own)	Fewer than or equal to three people per group		Four to six people per group	7-12 people per group	13-25 people per group	26-50 people per group	Greater than 50 people per group
e. **Contacts** (with other groups)	Fewer than three encounters/day at campsites and fewer than six encounters/day on travel routes		Three to six encounters/day off travel routes (campsites) and 7-15 encounters/day on travel routes	7-14 encounters/day off travel routes (e.g., staging areas) and 15-29 encounters/day en route	15-29 encounters/day off travel routes (e.g., campgrounds) and 30 or more encounters/day en route	People seem to be everywhere, but human contact is still intermittent	Other people constantly in view
f. **Types of Encounters**	Users plan trips to avoid others altogether	Take evasive actions for face-to-face avoidance	Users step aside to avoid unsafe conditions or user conflicts, sometimes grudgingly	Users may be unnerved but may not necessarily move off routes, areas, or sites to accommodate others	Users here routinely expect, welcome, and accommodate other visitors	Because crowd tolerance is a necessary condition for being here, encounters tend to be impersonal	People accept, but routinely ignore, multiple crowd interactions
g. **Personal Gear & Equipment**	Very basic gear, cell phones usually don't work here	Convenience gear (cell phones) but not radios	Expect hiking, climbing, and mountain bike gear (e.g., colorful sportswear, bicycle helmets, etc.), radios also may be playing	Expect to see gear associated with vehicle or off-highway vehicle use (e.g., coolers, body armor, etc.), radios and music also	Variety of traditional camper trailers, pop-up tents and conventional tents, radios and music common	Upscale motor homes common, dependant on utility hookups or having generators to support home conveniences and gadgetry	Very specialized gear dependent on service provider assistance (e.g., boat slips, grounds keepers, caretakers)

Table I-1. Natural Resource Recreation Settings: Criteria for Classification and Prescriptions *(Continued)*

	Primitive		Back Country	Middle Country	Front Country	Rural	Urban
	Pristine	Transition					
h. **Evidence of Use**	Only footprints may be observed		Footprints plus slight vegetative trampling at campsites and travel routes, only infrequent litter	Vehicle tracks and occasional litter and soil erosion, vegetation becoming worn	Well-worn soils and vegetation, but often gravel surfaced for erosion control	Paved routes protect soils and vegetation, but noise, litter, and facility impacts are pervasive	A busy place with what seems like constant noise; unavoidable litter seems to be a lifestyle choice
Administrative – *Administrative & Service Setting*: How Public Land Managers, County Commissioners and Municipal Governments, and Local Businesses Care for the Area and Serve Visitors and Local Residents							
i. **Visitor Services**	None is available onsite		Basic maps, but area personnel seldom available to provide onsite assistance	Area brochures & maps, plus area personnel occasionally present to provide onsite assistance	Information materials describe recreational areas and activities, area personnel are periodically available	Everything described to the left in this row area; personnel give onsite education	Everything described to the left in this row, plus regularly scheduled on-site outdoor skills, demonstrations, and clinics
j. **Management Controls**	No visitor controls apparent, enforcement presence very rare		Signs at key access points on basic user ethics; may have back-country user restrictions; enforcement presence rare	Occasional regulatory signing; motorized and mechanized use restrictions; random enforcement presence	Rules clearly posted with some seasonal or day-of-week use restrictions; periodic enforcement presence	Regulations prominent; total use limited by permit, reservation, etc; routine enforcement presence	Continuous enforcement to redistribute use and reduce user conflicts, hazards, and resource damage
k. **Domestic Animals**	No domestic animals allowed	Dogs and pack livestock on designated routes in designated areas only	Livestock (horses and llamas) allowed but, only on designated routes and areas. Dogs under control and pack routes	No controls on dogs and pack livestock other than standard regulations prohibiting wildlife harassment, etc.	Dogs on leashes and pack livestock only in designated areas within recreation sites; both under control elsewhere	Dogs on leashes everywhere and pack livestock allowed only in designated areas	Dogs on leashes everywhere and pack livestock allowed only under specific use restrictions (e.g., horse diapers, parades)
l. **Individual User Fees**	No individual user fees		Individual user fees charged within certain back-country areas	Additional fees charged individuals at some developed recreational sites, but not for any dispersed recreation uses	Individual user fees charged at all developed sites, but not yet for any dispersed recreation use	Individual user fees charged at all developed sites and for dispersed use within high-use areas only	Individual user fees routinely charged for recreation use
m. **Mechanized Use**	None		Mountain bikes and perhaps other mechanized use, but all are nonmotorized	Four-wheel drives, all terrain vehicles, dirt bikes or snowmobiles, in addition to non-motorized, mechanized use	Two-wheel drive vehicles predominant, but also four-wheel drives and non-motorized, mechanized use	Ordinary highway auto and truck traffic is characteristic	Wide variety of street vehicles and highway traffic is ever-present

Table I-1. Natural Resource Recreation Settings: Criteria for Classification and Prescriptions *(Continued)*

	Primitive		Back Country	Middle Country	Front Country	Rural	Urban
	Pristine	Transition					
Physical – Resources & Facilities: ***Character of the natural landscape***							
a. **Remoteness**	More than 10 miles from any road	More than 3 miles from any road	More than ½ mile from any kind of road, but not as distant as 3 miles, and no road is in sight	On or near four-wheel drive roads, but at least ½ mile from all improved roads, though they may be in sight	On or near improved country roads but at least ½ mile from all highways	On or near primary highways, but still within a rural area	On or near primary highways, municipal streets, and roads within towns or cities
b. **Naturalness**	Undisturbed natural landscape		Naturally appearing landscape having modifications not readily noticeable	Naturally appearing landscape, except for obvious primitive roads	Landscape partially modified by roads, utility lines, etc., but none overpower natural landscape features	Natural landscape substantially modified by agriculture or industrial development	Urbanized developments dominate this landscape
c. **Facilities**	None		Some primitive trails made of native materials, such as log bridges and carved wooden signs	Maintained and marked trails, simple trailhead developments, improved signs, and very basic toilets	Improved, yet modest, rustic facilities, such as campgrounds, restrooms, trails, and interpretive signs, primitive and developed boat launches	Modern facilities, such as campgrounds, group shelters, boat launches, and occasional exhibits	Elaborate full-service facilities, such as laundry, groceries, and book stores
Social – Visitor Use & Users: ***Character of recreation and tourism use***							
d. **Group Size** (other than own)	Fewer than or equal to three people per group		Four to six people per group	7-12 people per group	13-25 people per group	26-50 people per group	Greater than 50 people per group
e. **Contacts** (with other groups)	Fewer than three encounters/day at campsites and fewer than six encounters/day on travel routes		Three to six encounters/day off travel routes (campsites) and 7-15 encounters/day on travel routes	7-14 encounters/day off travel routes (e.g., staging areas) and 15-29 encounters/day en route	15-29 encounters/day off travel routes (e.g., campgrounds) and 30 or more encounters/day en route	People seem to be everywhere, but human contact is still intermittent	Other people constantly in view
f. **Types of Encounters**	Users plan trips to avoid others altogether	Users take evasive actions for face-to-face avoidance	Users step aside to avoid unsafe conditions or user conflicts, sometimes grudgingly	Users may be unnerved but may not necessarily move off routes, areas, or sites to accommodate others	Users here routinely expect, welcome, and accommodate other visitors	Because crowd tolerance is a necessary condition for being here, encounters tend to be impersonal	Here people accept but routinely ignore multiple crowd interactions
g. **Personal Gear and Equipment**	Very basic gear, cell phones usually don't work here	Convenience gear (cell phones), but not radios	Expect hiking, climbing, and mountain bike gear (e.g., colorful sportswear, bicycle helmets, etc.); radios also may be playing	Expect to see gear associated with vehicle or off-highway vehicle use (e.g., coolers, body armor, etc.); radios and music also	Variety of traditional camper trailers, pop-up tents and conventional tents, radios, and music common	Upscale motor homes common, dependant on utility hookups or having generators to support home conveniences and gadgetry	Very specialized gear dependent on service provider assistance (e.g., boat slips, grounds keepers, caretakers)

Table I-1. Natural Resource Recreation Settings: Criteria for Classification and Prescriptions *(Continued)*

	Primitive		Back Country	Middle Country	Front Country	Rural	Urban
	Pristine	Transition					
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Administrative – Administrative & Service Setting: How Public Land Managers, County Commissioners and Municipal Governments, and Local Businesses Care for the Area and Serve Visitors and Local Residents							
i. **Visitor Services**	None is available onsite		Basic maps, but area personnel seldom available to provide on-site assistance	Area brochures and maps, plus area personnel occasionally present to provide on-site assistance	Information materials describe recreational areas and activities; area personnel are periodically available	Everything described to the left in this row, area personnel give onsite education	Everything described to the left in this row, plus regularly scheduled on-site outdoor skills, demonstrations, and clinics
j. **Management Controls**	No visitor controls apparent; enforcement presence very rare		Signs at key access points on basic user ethics; may have back-country user restrictions; enforcement presence rare	Occasional regulatory signing; motorized and mechanized use restrictions; random enforcement presence	Rules clearly posted with some seasonal or day-of-week use restrictions; periodic enforcement presence	Regulations prominent; total use limited by permit, reservation, etc.; routine enforcement presence	Continuous enforcement to redistribute use and reduce user conflicts, hazards, and resource damage
k. **Domestic Animals**	No domestic animals allowed	Dogs and pack livestock on designated routes in designated areas only	Livestock (horses and llamas) allowed, but only on designated routes and areas. Dogs under control and pack routes	No controls on dogs and pack livestock other than standard regulations prohibiting wildlife harassment, etc.	Dogs on leashes and pack livestock only in designated areas within recreation sites; both under control elsewhere	Dogs on leashes everywhere and pack livestock allowed only in designated areas	Dogs on leashes everywhere and pack livestock allowed only under specific use restrictions (e.g., horse diapers, parades)
l. **Individual User Fees**	No individual user fees		Individual user fees charged within certain back-country areas	Additional fees charged individuals at some developed recreational sites, but not for any dispersed recreation uses	Individual user fees charged at all developed sites, but not yet for any dispersed recreation use	Individual user fees charged at all developed sites and for dispersed use within high-use areas only	Individual user fees routinely charged for recreation use
m. **Mechanized Use**	None		Mountain bikes and perhaps other mechanized use, but all are nonmotorized	Four-wheel drives, all terrain vehicles, dirt bikes, or snowmobiles ,in addition to nonmotorized, mechanized use	Two-wheel drive vehicles predominant, but also four-wheel drives and nonmotorized, mechanized use	Ordinary highway auto and truck traffic is characteristic	Wide variety of street vehicles and highway traffic is ever present

3.0 Detailed Descriptions of Off-Highway Vehicle (OHV) Designations Used in the Kemmerer Resource Management Plan (RMP)

The Kemmerer Resource Management Plan (RMP) includes off-highway vehicle (OHV) designations as follows:

- Area Open to All Motor Vehicle Travel
- Motor Vehicle Travel Limited to Existing Roads and Trails
- Motor Vehicle Travel Limited to Designated Roads and Trails
- Area Closed to All Motor Vehicle Travel
- Motor Vehicle Travel Closed During Certain Times of the Year

This appendix provides clear definitions of what each designation means so that the potential for misunderstanding is minimized. These designations apply on a sub-area basis, with the specific designations shown on the maps.

Designation: Open to All Motor Vehicle Travel

- OHVs may be operated off-road on the public lands as long as this activity neither causes nor is likely to cause significant, undue damage to or disturbance of the soil, wildlife, wildlife habitats, improvements, cultural, or vegetative resources or other authorized uses of the public lands.
- In open areas, motor vehicle travel is allowed off-road at all times.
- Activities such as hill climbing or organized OHV events may be allowed if the area is approved for such activities.

Designation: Motor Vehicle Travel Limited to Existing Roads and Trails

- This designation includes all roads and trails that were in existence when the RMP was approved.
- Portal signs will be placed on main travel routes entering the area from highways or other public roads.
- Maps or brochures showing OHV designations will be published.
- This designation is effective on the date the RMP is approved.

Designation: Motor Vehicle Travel Limited to Designated Roads and Trails

When this designation is implemented, motor vehicle travel will be allowed on all roads designated as open to such travel. All other roads in the area, if any, are closed to motor vehicles.

- Signs will be placed on main travel routes entering the area.
- Signs will be placed on individual "designated" roads in the area.
- Closed roads will be marked or will be obliterated and reclaimed.
- Maps and (or) brochures will be published to show the network of authorized roads and vehicle routes.
- Between the time of publication of the RMP and implementation of this designation, all motor vehicle travel would be limited to existing roads and trails.

Designation: Closed to All Motor Vehicle Use

Motor vehicle access is allowed only upon approval of the authorized officer.

- Motor vehicle travel may be allowed for firefighting and emergencies only.
- This designation applies to all resource uses.

Designation: A Seasonal Limitation on Motor Vehicle Access Has Been Established

Motor vehicle travel is not allowed for a portion of the year, usually to protect wintering wildlife on crucial winter ranges.

- The area is closed to all motor vehicles from (date to date); e.g., January 1 – April 30.
- Nonmotorized access/travel is authorized the entire calendar year.
- Seasonal closure to motor vehicle access is necessary to protect big game species on crucial winter range.
- Signs would be placed on all roads on public land entering the seasonal closure area.
- Maps or brochures showing the area would be published
- Seasonal closures are usually coordinated with other management agencies, such as the Wyoming Game and Fish Department (WGFD).

The above could "overlap" parts or all of other OHV decisions. It may be appropriate to close certain roads seasonally for a variety of resource-related reasons.

OHV Access for Persons with Disabilities

Section 504 of the Rehabilitation Act (Public Law 93-112, as amended) requires federal land-managing agencies to provide reasonable opportunities for access for persons with disabilities. Accordingly, during hunting seasons, individuals possessing a valid WGFD "Permit for Hunters with Qualifying Disabilities" will be allowed to use an OHV to retrieve harvested big game and trophy game animals in LIMITED areas beyond the 300-foot travel zone without any additional authorization, providing resource damage or the creation of new roads do not occur.

In addition, field managers will consider requests by persons with disabilities for authorization for cross-country travel for the purposes of gaining access to the public lands for recreational purposes. These requests will be considered on a case-by-case basis. Decisions will be based on a combination of factors, including need, other available opportunities, resource management considerations, and the assurance that the activity can be carried out without causing resource damage. If OHV use authorizations are granted, the above criteria will be included in the written authorization.

Travel Management Planning

Travel management planning is an ongoing function at the field office level. It includes developing inventories that serve as the basis for travel and transportation decisions. It will address issues such as the need for additional access, additional roads or trails, or the need to upgrade or reroute existing roads, the need to close certain roads, or the need to update or change OHV or other travel and transportation-related designations. Travel and transportation decisions will be based on resource management and development needs, public involvement, and coordination with state and local governmental agencies and the public. Travel management planning includes motorized, nonmotorized, mechanized, equestrian, over-snow, and other modes of travel.

From time to time, roads are built on public lands for the purposes of facilitating resource development, such as oil and gas operations. These roads are authorized by the BLM under valid RMP decisions. In such cases, they are added to the authorized system of roads and incorporated into the existing OHV designations.

Glossary Definitions

Resource Damage: Defined as leaving signs of vehicle use, such as wheel ruts in wet meadows, visual scars on hillsides, or soil erosion. Additional examples include surface disturbance that causes the loss of vegetative cover, degradation of wildlife habitats, the creation of new roads, and the introduction of noxious weeds. Damage to vegetation also includes crushing or uprooting trees and shrubs. The determination of whether resource damage has occurred is left to the discretion of field managers and law enforcement personnel.

Dispersed Recreation: Recreational activities are considered "dispersed" when they do not depend on developed facilities, such as campgrounds, playgrounds, or developed park areas. User density is often low relative to developed or intensive recreation. Activities thought of as examples of dispersed recreation include, but are not limited to primitive camping, hunting, hiking, and off-highway driving. Dispersed recreation is usually noncommercial.

Dispersed Uses: Certain activities occur on BLM-administered lands that do not require specific authorizations and do not necessarily cause any appreciable disturbance or damage to the public lands. Dispersed camping, parking, picnicking, and recovering a harvested big game animal are examples. These are activities that can normally be accomplished within a minimal distance of roads and vehicle trails. The public is allowed to pursue these activities up to 300 feet away from roads and trails as long as such activities do not cause resource damage or create new roads or extend existing roads.

Existing Roads and Trails: Routes existing prior to the date the OHV designation is announced in the *Federal Register*. These routes may have been constructed and maintained, or may be two-track routes created and maintained, by the passage of motor vehicles and receive regular use.

Designated Routes: Designated routes are a network of roads and trails, specifically identified as the official travel and transportation network for a given area. Designated roads and trails are identified on maps, identified by signs in the field, and may be assigned road numbers for inventory and identification purposes. This may include routes on the official BLM transportation plan that are routinely maintained, as well as routes that were user-created and receive no regular maintenance.

Trails: The term "trails," when used in the phrase "roads and trails" in association with OHV designations means motor vehicle trails only. These include distinct two-track vehicle trails or single-track motorcycle trails created by the passage of motor vehicles and which receive continuous use. Cow paths, foot trails, mountain bike trails, and game trails are not motor vehicle trails; therefore, motor vehicle travel is not allowed on them. Vehicle traces created by the unauthorized passage of a few motor vehicles are not legal motor vehicle trails.

Mechanical Transport: Nonmotorized vehicles, devices, or contrivances for moving people or material over land, water, snow, or air that have moving parts are considered mechanical transport. This includes, but is not limited to, sailboats, sailboards, hang gliders, parachutes, bicycles, game carriers, hand carts, wheel barrows, and wagons. The term does not include wheelchairs, nor does it include horses or other pack stock, skis, snowshoes, nonmotorized river craft including, but not limited to, drift boats, rafts, and canoes, or sleds, travois, or similar devices without moving parts. The terms "mechanical transport" and "motor vehicle" are not synonymous.

Off-Road Travel: The term "off-road travel" means travel off of existing roads and trails or driving cross-country.

Closed Areas: Areas under the "closed" designation are closed to all motor vehicle use. Motor vehicle access is allowed only for emergencies or by special authorization from the authorized officer.

Recreation Opportunity Spectrum (ROS): The Recreation Opportunity Spectrum (ROS) provides a framework for stratifying and defining classes of outdoor recreation opportunity environments. Possible mixes of activities, settings, and experience opportunities have been arranged along a spectrum known as the ROS. Each of several classes, ranging from primitive to urban, is defined in terms of its combination of activity, setting, and experience opportunities. ROS classes become an integral part of management prescriptions for recreation in the RMP.

Necessary Tasks: Necessary tasks are actions that support commercial or industrial uses of public lands and need to be accomplished by a person or organization seeking or holding an authorization from the BLM. These include tasks that are sometimes accomplished without formal written approval or in advance of receiving an authorization.

KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX J

Technical Support Document for Air Quality

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Appendix J
Technical Support Document for Air Quality

This technical support document describes the process used to conduct air quality impact analysis for the Kemmerer Resource Management Plan (RMP) revision, Draft Environmental Impact Statement (EIS). This document will serve as the basis for subsequent air quality impact analyses of other alternatives and the preferred alternative. Appendix J is divided into the following six sections:

1.0 Regulatory Framework
2.0 Agency Roles and Authorities
3.0 Existing Air Quality
4.0 Air Quality Impact Analysis
5.0 Emission Calculations
6.0 References

Copies of this technical support document and accompanying data files are available upon request from the Bureau of Land Management (BLM) Kemmerer Field Office.

1.0 REGULATORY FRAMEWORK

For quantitative analysis, the air quality criteria discussed in the paragraphs below apply. Although the criteria listed do not apply to the qualitative analysis presented in the Kemmerer Air Quality Analysis, they are identified here for reference purposes. The basic framework for controlling air pollutants in the United States is mandated by the 1970 Clean Air Act (CAA) and its amendments and the 1999 Regional Haze Regulations. The CAA addresses criteria air pollutants, state and national ambient air quality standards for criteria air pollutants, and the Prevention of Significant Deterioration program. The Regional Haze Regulations address visibility impairment.

Ambient Air Quality Constituents

Air pollutants addressed in this study include criteria pollutants, hazardous air pollutants (HAP), and sulfur and nitrogen compounds, which could cause visibility impairment or atmospheric deposition impacts.

Criteria Pollutants

Criteria pollutants are those for which national standards of concentration have been established. Ambient air concentrations of these constituents greater than the standards represent a risk to human health. Criteria pollutants include carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), particulate matter (PM_{10}, $PM_{2.5}$), and lead, each of which is listed below.

Carbon Monoxide. CO is an odorless, colorless gas formed during any combustion process, such as operation of engines, fireplaces, and furnaces. High concentrations of CO affect the oxygen-carrying capacity of the blood and can lead to unconsciousness and asphyxiation. Wildfires are natural sources of CO.

Nitrogen Dioxide. NO_2 is a red-brown gas formed during operation of internal combustion engines. Such engines emit a mixture of nitrogen gases, collectively called nitrogen oxides (NO_x). NO_x can contribute to brown cloud conditions and can convert to ammonium nitrate particles and nitric acid, which can cause visibility impairment and acid rain. Bacterial action in soil can be a natural source of nitrogen compounds.

Sulfur Dioxide. SO_2 forms during combustion from trace levels of sulfur in coal or diesel fuel. It can convert to ammonium sulfate and sulfuric acid, which can cause visibility impairment and acid rain. Volcanoes are natural sources of SO_2. Anthropogenic sources include refineries and power plants.

Ozone. O_3 is a gas that generally is not emitted directly into the atmosphere, but is formed from NO_x and volatile reactive organic compound (VOC) emissions. As stated above, internal combustion engines are the main source of NO_x. VOCs, such as terpenes, are very reactive. Sources of VOCs include, but are not limited to, paint, varnish, and types of vegetation. The faint acrid smell common after thunderstorms is caused by ozone formation caused by lightning. O_3 is a strong oxidizing chemical that can burn lungs and eyes, as well as damage plants.

Particulate Matter. Particulate matter (e.g., soil particles, hair, pollen) are essentially small particles suspended in the air that settle to the ground slowly and may be re-suspended if disturbed. Separate allowable concentration levels for particulate matter are based on the relative size of the particle:

- PM_{10} particles, particles with diameters of less than 10 micrometers, are small enough to be inhaled and can cause adverse health impacts.
- $PM_{2.5}$ particles, particles with diameters of less than 2.5 micrometers, are so small that they can be drawn deeply into the lungs and cause serious health problems. Particles of this size also are the main cause of visibility impairment.

Lead. Before the widespread use of unleaded fuel in automobiles, lead particles were emitted from automobile tailpipes. Lead is not considered in this RMP/EIS because no proposed projects are expected to emit lead. The lead standard also will not be addressed in this appendix because lead is not a current concern; it will, however, be considered in future projects, as applicable.

Hazardous Air Pollutants

Although HAPs, including N-hexane, ethylbenzene, toluene, xylene, formaldehyde, and benzene, do not have ambient air quality standards, the U.S. Environmental Protection Agency (EPA) has issued reference concentrations for evaluating the inhalation risk for cancerous and noncancerous health impacts, known as reference concentrations for chronic inhalation.

The EIS associated with the Kemmerer RMP is a National Environmental Policy Act (NEPA) document and not a regulatory document, but the Record of Decision is binding and a "public record" (see 40 Code of Regulations [CFR] 1505.2). In addition, there are regulatory issues that should be taken into account in preparing this EIS and ensuing project-specific EISs. Regulation of HAPs is achieved through compliance with the applicable maximum achievable control technology (MACT) standards and not through ambient air quality standards. Regulatory agencies implement control through Section 112 programs, specifically Section 112(g) case-by-case MACT determinations based on 40 CFR Part 63, Subpart B, and Section 112(d) MACT emission standards.

Any source that emits or has the potential to emit 10 tons per year or more of any HAP or 25 tons per year or more of any combination of HAPs is considered a major source and will require a Title V, Part 70, operating permit review and permit. This may include either a case-by-case 112(g) MACT determination, if the source is new or has had major modifications and no applicable MACT emission standard has been promulgated, or compliance with an applicable MACT emission standard. Specific regulations that may apply in the planning area include 40 CFR Part 63 Subpart HH, National Emission Standards for Hazardous Air Pollutants From Oil and Natural Gas Production Facilities; 40 CFR Part 63 Subpart HHH, National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities; and 40 CFR Part 63 Subpart ZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. This last regulation, new in 2004, affects source categories using reciprocating engines for gas compression.

HAP emissions are associated with industrial activities, such as oil and gas operations, refineries, paint shops, dry cleaning facilities, and woodworking shops. Because this analysis is qualitative, no specific analyses of either short- or long-term HAP impacts are made.

Atmospheric Deposition Constituents

Sulfur and nitrogen compounds that can be deposited in terrestrial and aquatic ecosystems include nitric acid, nitrate, ammonium, and sulfate. Nitric acid and nitrate are not emitted directly into the air, but form in the atmosphere from industrial and automotive emissions of NO_x. Sulfate is formed in the atmosphere from industrial emission of sulfur dioxide (SO_2). Deposition of nitric acid, nitrate, and sulfate can adversely impact plant growth, soil chemistry, lichens, aquatic environments, and petroglyphs. Ammonium is primarily associated with feedlots and agricultural fertilization. Ammonium deposits can affect terrestrial and aquatic vegetation. Although deposition may be beneficial as a fertilizer, it can adversely impact the timing of plant growth and dormancy.

Although this analysis will be qualitative, future specific projects will require quantitative analyses using the criteria listed below.

Wyoming and National Ambient Air Quality Standards

Wyoming Ambient Air Quality Standards (WAAQS) and National Ambient Air Quality Standards (NAAQS) are health-based standards for the maximum concentration of air pollutants at all locations to which the public has access. The WAAQS and NAAQS are legally enforceable standards. Concentrations above the WAAQS and NAAQS represent a risk to human health. State standards must be as strict as, or stricter than, federal standards.

The EPA has developed standards for each pollutant for a specific averaging time (see Table J-1). Short averaging times (1, 3, and 24 hours) addresses short-term exposure, while the annual standards address long-term exposure. Longer-term standards are set to lower allowable concentrations than are short-term standards to recognize the cumulative impacts of long-term exposure.

Prevention of Significant Deterioration

The goal of the Prevention of Significant Deterioration (PSD) program is to ensure that air quality in areas with clean air does not significantly deteriorate, while a margin for future industrial growth is maintained. Under the PSD program, each area in the United States is classified by the air quality in that region according to the following system:

- **PSD Class I Areas.** Areas with pristine air quality, such as wilderness areas, national parks, and some Indian reservations, are accorded the strictest protection. Only very small incremental increases in pollutant concentrations are allowed in order to maintain the very clean air quality in these areas.
- **PSD Class II Areas.** Essentially, all areas that are not designated as Class I are designated as Class II. Moderate incremental increases in pollutant concentrations are allowed, although the concentrations are not allowed to reach the concentrations set by Wyoming and federal standards (WAAQS and NAAQS).
- **PSD Class III Areas.** No areas have been designated yet as Class III. A larger incremental increase in pollutant concentrations would be allowed, up to the WAAQS and NAAQS.

Table J-1. National and Wyoming Ambient Air Quality Standards

Pollutant	Average Time	NAAQS (μg/m^3)	WAAQS (μg/m^3)
Carbon Monoxide (CO)	1 hour	40,000	40,000
	8 hours	10,000	10,000
Nitrogen Dioxide (NO_2)	Annual[1]	100	100
Ozone (O_3)	1 hour	235	235
	8 hours	157	157
Particulate Matter (PM_{10})	24 hours	150	150
	Annual	50	50
Particulate Matter ($PM_{2.5}$)	24 hours	65	65
	Annual	15	15
Sulfur Dioxide (SO_2)	3 hours	1,300[2]	1,300
	24 hours	365	260
	Annual	80	60
Hydrogen Sulfide (H_2S)	½ hour[3]	-	70
	½ hour[4]	-	40

Sources: Wyoming DEQ 2004; EPA 2006a

[1] The standard of 100 μg/m^3 NO_2 is equivalent to a standard of 0.05 ppm (Wyoming DEQ 2004).

[2] Secondary standard only, as there is no 3-hour federal primary standard for SO_2.

[3] Average not to be exceeded more than two times per year.

[4] Average not to be exceeded more than two times in any 5 consecutive days.

μg/m^3	micrograms per cubic meter
NAAQS	National Ambient Air Quality Standards
WAAQS	Wyoming Ambient Air Quality Standards

Table J-2 provides the incremental increases allowed for specific pollutants in Class I and Class II areas.

Comparisons of potential PM_{10}, NO_2, and SO_2 concentrations with PSD increments are intended to evaluate a threshold of concern only and do not represent a regulatory PSD increment consumption analysis. Regulatory PSD increment consumption analyses are solely the responsibility of the State of Wyoming, which has been granted primacy (with EPA oversight) under the CAA.

In project-specific EISs, the BLM does not expect that a PSD analysis will be performed; rather, the PSD standards are used as a reference only to give the public a better understanding of the level of potential impact.

Table J-2. Prevention of Significant Deterioration Increments

Pollutant	Average Period	PSD Increment (μg/m^3) Class I	PSD Increment (μg/m^3) Class II
Sulfur Dioxide (SO_2)	3-hours[1] 24-hours[1] Annual	25 5 2	512 91 20
Particulate Matter (PM_{10})	24-hours Annual	8 4	30 17
Nitrogen Dioxide (NO_2)	Annual	2.5	25
Carbon Monoxide (CO)	1-hour 8-hours	None None	None None
Lead	3-months	None	None

Source: Wyoming DEQ 2004

[1] The maximum allowable increment may be exceeded once per year at any receptor site (Wyoming DEQ, 2004).

PSD	Prevention of Significant Deterioration

Regional Haze Regulations

Visibility impairment in the form of regional haze obscures the clarity, color, texture, and form of what we see. Haze-causing pollutants (mostly fine particles) are directly emitted into the atmosphere or are formed when gases emitted into the air form particles as they are carried downwind. Emissions from human-caused and natural sources can be carried great distances, contributing to regional haze. The Wyoming Department of Environmental Quality–Air Quality Division (DEQ AQD) submitted its Regional Haze State Implementation Plan (SIP) in accordance with 40 CFR, Part 51.309, in December 2003. The EPA has not taken action yet on this SIP.

Visual range, one of several ways to express visibility, is the farthest distance at which a person can distinguish a dark landscape feature from a light background, such as the sky. Without human-caused visibility impairment, natural visual range is estimated to average about 110 to 115 miles in the western United States and 60 to 80 miles in the eastern United States (Malm 1999).

The EPA developed regional haze regulations in response to the CAA amendments of 1977 and 1990. These regulations are intended to maintain visibility on the least-impaired days and to improve visibility on the most-impaired days in mandatory federal Class I areas across the United States, so that visibility in these areas is returned to natural conditions by the year 2064. These regulations require states to submit a regional haze SIP and progress reports to demonstrate reasonable progress toward the 2064 goal.

Applicability to the Kemmerer Planning Area

Air pollution impacts are limited by local, state, tribal, and federal air quality regulations, standards, and implementation plans established under the CAA and administered by the Wyoming DEQ AQD with oversight from the EPA. Air quality regulations require that proposed new, or modified existing, air pollutant emission stationary sources (including oil and gas compression facilities) undergo a permitting review before their construction can begin. Therefore, the Wyoming DEQ AQD has the primary authority and responsibility to review permit applications and to require emission permits, fees, and control devices before construction or start of operation.

Fugitive dust and exhaust from construction activities, along with air pollutants emitted during operation (for example, well operations, booster [field] and pipeline [sales] compressor engines associated with natural gas wells), are potential causes of air quality impacts. These issues are more likely to generate public concern where natural gas development activities occur near residential areas or near sensitive Class I and Class II areas.

The U.S. Forest Service (USFS), the National Park Service (NPS), and the U.S. Fish and Wildlife Service (USFWS), located throughout Wyoming, also have expressed concerns about potential atmospheric deposition (acid rain) and visibility impacts within downwind PSD Class I and PSD Class II sensitive areas under their administrations.

The NAAQS and the WAAQS are health-based standards for the maximum acceptable concentrations of air pollutants at locations to which the public has access. The analysis of the proposed alternatives must demonstrate continued compliance with all applicable local, state, tribal, and federal air quality standards. Existing air quality throughout the project area is in attainment of all ambient air quality standards, as demonstrated by the relatively low concentration levels presented in Tables J-3 and J-4.

Air quality regulations require that stationary proposed new or modified existing air pollutant emission sources (including oil and gas compression facilities) undergo a permitting review before their construction can begin. Therefore, the Wyoming DEQ AQD has been given primary authority over and responsibility for reviewing permit applications and for requiring emission permits, fees, and control device before construction and (or) operation. In addition, the U.S. Congress (through CAA Section 116) authorized local, state, and tribal air quality regulatory agencies to establish air pollution control requirements more (but not less) stringent than federal requirements. Also, under both the Federal Land Policy and Management Act and the CAA, the BLM cannot authorize any activity that would not conform to all applicable local, state, tribal, and federal air quality laws, regulations, standards, and implementation plans.

Given the project area's current attainment status, future development projects that have the potential to emit more than 250 tons per year of any criteria pollutant (or certain listed sources that have the potential to emit more than 100 tons per year) would be required to undergo a site-specific regulatory PSD increment consumption analysis under the federal New Source Review permitting regulations. Development projects that require PSD permits also may be required by the applicable air quality regulatory agencies to incorporate additional emission control measures (including a best available control technology [BACT] analysis and determination) to ensure protection of air quality resources and to demonstrate that the combined impacts of all PSD sources will not exceed the allowable incremental air quality impacts for NO_2, PM_{10}, and SO_2. Minor sources having emissions below the cutoff rates mentioned above do not require PSD permits; nevertheless, their emissions consume increment.

A regulatory PSD increment consumption analysis may be conducted, either as part of a New Source Review or independently. The determination of PSD increment consumption is a legal responsibility of the applicable air quality regulatory agencies, with EPA oversight. In addition, an analysis of cumulative impacts due to all existing sources and the permit applicant's sources is required during a New Source Review to demonstrate that applicable ambient air quality standards will be met during the operational lifetime of the permit applicant's operations.

Table J-3. Background Concentrations and Applicable Ambient Air Quality Standards

Pollutant/	Averaging Time/	Concentration (μg/m^3)	NAAQS (μg/m^3)	WAAQS (μg/m^3)	Location/Sampling Dates
Nitrogen Dioxide	Annual	3.4	100	100	Green River Basin Visibility Study, Green River, WY (2001)
Ozone	8 Hours	147	157	157	Green River Basin Visibility Study, Green River, WY (2001)
PM_{10}	24 Hours	48	150	150	Moxa Arch Infill Project, Rock Springs, WY (2005)
	Annual	25	50	50	
Carbon monoxide	1 Hour	2229	40,000	40,000	Colorado Oil Shale Projects, Rifle and Mack, CO (early 1980's)
	8 Hours	1148	10,000	10,000	
Sulfur dioxide	3 Hours	29	1,300	1,300	Craig Power Plant and oil shale areas (1980-1984)
	8 Hours	18	365	260	
	Annual	5	80	60	

Source: Wyoming DEQ AQD 2006

μg/m^3	micrograms per cubic meter
NAAQS	National Ambient Air Quality Standards
PM_{10}	particulate matter less than 10 microns in diameter
ppm	parts per million
WAAQS	Wyoming Ambient Air Quality Standards

Table J-4. Ambient Concentrations Measured near Specific Sources

Pollutant/Monitoring Station (Monitor ID)	Average Time/ Measurement	Concentration (µg/m^3) (Annual Average or 24-Hour Maximum)			NAAQS (µg/m^3 for PM$_{10}$)
		2003	2004	2005	
PM$_{10}$ (µg/m^3)					
FMC Skull Point Mine, Kemmerer, Lincoln County (560230800)[1]	Annual	33	16	23	50
	24 Hours	189	44	221	150
Pittsburg and Midway Coal #1, Kemmerer, Lincoln County (560230814)	Annual	7	5	7	50
	24 Hours	22	18	16	150
Pittsburg and Midway Coal #2, Kemmerer, Lincoln County (560230815)	Annual	8	8	9	50
	24 Hours	30	21	23	150
Pacificorp Naughton Plant, Kemmerer, Lincoln County (560230820)	Annual	18	18	13	50
	24 Hours	104	110	60	150
FMC Trona Site 002, Sweetwater County (560371002)	Annual	12	11	13	50
	24 Hours	39	34	32	150
FMC Trona Site 866, Sweetwater County (560371002)	Annual	19	18	19	50
	24 Hours	54	63	101	150
General Chemical Site 1, Sweetwater County (560370013)	Annual	20	20	18	50
	24 Hours	68	72	57	150
General Chemical Site 3, Sweetwater County (560370013)	Annual	12	11	11	50
	24 Hours	33	29	26	150
General Chemical Site 4, Sweetwater County (560370013)	Annual	16	14	15	50
	24 Hours	48	55	38	150

Source: EPA 2006a

[1] Although this mine is now held by Pittsburg and Midway Coal Company and is no longer called Skull Point Mine, this is still the name of the monitoring station used in EPA (2006a).

µg/m^3	micrograms per cubic meter
ID	Identification
N/A	not applicable
NAAQS	National Ambient Air Quality Standards
PM$_{10}$	particulate matter less than 10 microns in diameter
ppm	parts per million

Sources subject to the PSD permit review procedure also are required to demonstrate potential impacts on air quality-related values (AQRV). These include visibility impacts, degradation of mountain lakes due to atmospheric deposition (acid rain), and impacts on sensitive flora and fauna in Class I areas. The CAA also provides specific visibility protection procedures for the mandatory federal Class I areas designated by the U.S. Congress on August 7, 1977, which included wilderness areas greater than 5,000 acres in size, as well as national parks and national memorial parks greater than 6,000 acres in size as of that date.

2.0 AGENCY ROLES AND AUTHORITIES

U.S. Environmental Protection Agency

The EPA administers the federal CAA (42 U.S. Code [U.S.C.] 7401 et seq.) to maintain the NAAQS that protect human health and to preserve the rural air quality in the region by ensuring the PSD Class I and Class II increments for SO_2, NO_2, and PM$_{10}$ are not exceeded. The EPA has delegated this CAA authority to the State of Wyoming.

Wyoming Department of Environmental Quality

Wyoming regulates pollutants emitted into the air through the Wyoming Environmental Quality Act (W.S. 35-11-101 et seq.). Wyoming also is authorized by an approved SIP to administer all requirements of the PSD permit program under the CAA. In addition, the approved Wyoming SIP contains a number of programs that provide for the implementation, maintenance, and enforcement of the NAAQS, including a New Source Review program for minor source permitting that requires, among other things, an application of BACT for all new or modified sources, regardless of size or source category. Included, as well, are authorities for the control of particulate emissions, such as including fugitive particulate emissions from haul roads, access roads, or general facility boundaries. Wyoming also has been delegated the responsibility for operating an approved ambient air quality monitoring network for the purpose of demonstrating compliance with the NAAQS and the WAAQS.

Bureau of Land Management

NEPA requires that federal agencies consider mitigation of direct, indirect, and cumulative impacts during their preparation of an EIS (BLM Land Use Planning Manual 1601). Under the CAA, federal agencies must comply with SIPs regarding the control and abatement of air pollution. Before approval of RMPs or amendments to RMPs, the state director is to submit any known inconsistencies with SIPs to the governor of that state. If the governor of the state recommends changes in the proposed RMP or amendment to meet SIP requirements, the state director shall give the public an opportunity to comment on those recommendations (BLM Land Use Planning Manual, Section 1610.3-2).

U.S. Forest Service

The USFS administers national forests, which include several wilderness areas that could be affected by direct impacts associated with the project, such as the Bridger and Fitzpatrick wilderness areas which have mandatory federal Class I designations. As federal land mangers, the USFS could act as a consultant to recommend that the BLM impact analysis results, or any future EPA- or state-administered PSD refined impact analysis results (if justified), trigger adverse impairment status. If the USFS determines impairment of wilderness areas, the BLM, the state, and/or the EPA might need to mitigate this predicted adverse air quality impact.

National Park Service

Two areas administered by the NPS with a mandatory federal Class I area designation, Grand Teton and Yellowstone National Parks, could be affected by direct impacts associated with emissions within the planning area. As federal land managers, the NPS could act as a consultant to recommend that the BLM impact analysis results, or any future EPA- or state-administered PSD refined impact analysis results (if justified), trigger adverse impairment status. If the NPS determines impairment of NPS-administered Class I areas, the BLM, the state, and/or EPA might need to mitigate this predicted adverse air quality impact.

3.0 EXISTING AIR QUALITY

As described in Chapter 3, Affected Environment (Air Quality section), specific air quality monitoring is not conducted throughout most of the project area, but air quality conditions are considered to be generally good, as characterized by limited air pollution emission sources (few industrial facilities and residential emissions in the relatively small communities and isolated ranches) and good atmospheric dispersion conditions, resulting in relatively low air pollutant concentrations. Table J-3 summarizes the ambient air quality background concentrations in the planning area. This information was provided by the Wyoming DEQ. Although monitoring is conducted primarily in urban or industrial areas, the data selected are considered to be the best available representation of background air pollutant concentrations throughout the project area. The assumed background pollutant concentrations are below applicable ambient air quality standard for all pollutants and averaging times (although ozone levels approach the standards). Federal standards, Wyoming standards, and PSD increment values are presented in Tables J-1 and J-2.

4.0 AIR QUALITY IMPACT ANALYSIS

As described in Chapter 4, Environmental Consequences (Air Quality section), a qualitative emission comparison approach was used for this assessment. A qualitative method was selected because of a lack of specific project information on location, types, and magnitude of potential projects.

Emissions calculations were based on the best available engineering data and assumptions, emission inventory procedures, and professional and scientific judgment. However, where specific data or procedures were not available, activity assumptions were incorporated, as documented in the emission spreadsheets.

For any future projects, significance criteria for potential air quality impacts will include local, state, tribal, and federally enforced legal requirements to ensure that air pollutant concentrations remain within specific allowable levels. Table J-1 presents these requirements and legal limits.

Because the potential air pollutant emission sources comprise many small sources spread out over a very large area, discrete visible plumes are not likely to impact the distant sensitive areas, but the potential for cumulative visibility impacts (increased regional haze) is a concern. Regional haze degradation is caused by fine particles' and gases' scattering and absorbing light. Potential changes to regional haze are calculated in terms of a perceptible "just noticeable change" (1.0 deciview) in visibility when compared to background conditions in mandatory federal PSD Class I areas.

It is important to note that before actual development could occur, the applicable air quality regulatory agencies (including the state, tribe, or the EPA) would need to review specific air pollutant emissions preconstruction permit applications that examine potential project-specific air quality impacts. As part of these permit reviews (depending on source size), the air quality regulatory agencies could require additional air quality impact analyses or mitigation measures. Thus, before development occurred, additional site-specific air quality analyses would be performed to ensure protection of air quality. Federal land managers would require a demonstration that potential effects from proposed projects would not adversely impact AQRV (including visibility) in sensitive Class I and Class II areas.

5.0 EMISSION CALCULATIONS

When reviewing the emission inventory, it is important to understand that assumptions were made regarding development. For example, there is uncertainty regarding ultimate development of energy resources (e.g., number of wells, equipment used, specific locations of wells, etc.). In general, the assumptions that were made would tend to result in a conservatively high estimate of emissions. For instance, given the number of sources included in this analysis, the likelihood that all emission sources would actually operate at their reasonable, foreseeable maximum emission rates over an entire year (or even 24 hours) is small.

Summary emission inventories for each of the BLM activities for all of the alternatives are found in Chapter 4, Air Quality section. Activity data used to estimate emissions for proposed emission sources were obtained from Kemmerer Field Office staff and NEPA analyses performed for BLM actions within Wyoming that are similar to those associated with the actions proposed in this RMP/EIS (BLM 2002; BLM 2005). Emission factors used to estimate proposed emissions were obtained from (1) the EPA NONROAD Emissions Model (EPA 2004), (2) Wyoming DEQ AQD BACT levels for natural gas-fired internal combustion engines (Hanify 2006 and Wyoming DEQ 2000), (3) MOBILE6 emissions models for on-road vehicles (EPA 2003), and (4) EPA AP-42 emission factors for various activities (EPA 2006b).

The analysis includes emissions estimates for the following activities: (1) oil development, (2) coalbed natural gas and conventional natural gas development, (3) coal mine development, (4) salable and locatable minerals development, (5) renewable energy development, (6) livestock management activities, (7) vegetation management, (8) fire management (including prescribed fire), (9) forest and woodlands activities, (10) rights-of-way, (11) OHV use, (12) resource roads, and (13) trona mining and processing. Activities related to cultural resources, paleontology, recreation, noxious and invasive weed control, and wildlife and fish would produce inconsequential amounts of air emissions.

Assumptions Used in Developing Emissions for the Kemmerer RMP

The following assumptions were used in the emission calculations:

- All emission sources operated at their reasonably foreseeable maximum emission rates (as identified in the other resource sections of this document) simultaneously throughout the area.
- All producing coalbed natural gas (CBNG) and conventional oil and gas wells projected in the RFD and existing currently were assumed to be fully operational and to remain operating, except for normal projected well closures throughout the area (well numbers are from BLM 2006a).
- For oil, gas, and CBNG wells, development of new federal producing wells was assumed to occur at a uniform rate from 2004 through 2020.
- Induced or secondary growth (e.g., increases in vehicle miles traveled) is not included in the emissions inventory. In addition, emissions from burning fossil fuels produced from BLM mineral estate are not included (unless the emissions are from a facility sited on BLM surface land or are directly attributable to activities on BLM surface). Only activities directly related to BLM actions are considered.
- Emissions from skid-mounted or portable asphalt hot mix plants that are occasionally sited on BLM land at sand and gravel pits are not included. These plants are temporary (typically seasonal).
- Stationary sources associated with oil and gas development would operate at emission levels based on currently observed BACT levels, and compressor stations for natural gas and CBNG would be equipped with nonselective catalytic reduction (NSCR) catalyst.
- Activity data associated with management actions other than those related to oil and gas wells (including CBNG wells) were averaged over the entire analysis period to produce annual average emissions, except for renewable energy development, where one development activity was assumed to occur in one year (2011) for modeling purposes and, for Alternatives C and D (which have 2 and 1.5 development activities, respectively), any remaining development activity was assumed to occur in 2020.
- EPA off-road emission standards were used to estimate emissions for non-road sources in project years 2006, 2011, and 2020. This approach simulates the replacement of existing sources by new lower-emitting equipment with future EPA off-road emission standards.
- Use of water application as a Best Management Practice (BMP) would reduce fugitive dust emissions from ground-disturbing activities during construction and reclamation activities and maintenance of roads at project sites by 50 percent from uncontrolled levels.
- BMPs for surface-disturbing activities are applied under all alternatives. BMPs provide protection to soil resources and minimize adverse impacts to soil stability, compaction, and productivity.

Also, it should be noted that the estimates of emissions often employ resource-specific assumptions about equipment use (e.g., horsepower, load factor, operating hours per day, and number of days per activity) that are based on the best professional judgment of BLM staff. BLM has taken all possible steps to ensure the assumptions are reasonable; however, the estimates of current and future emissions are just that – estimates.

Detailed descriptions for emissions estimation for each activity follow. Individual tables of air emissions for all BLM activities were calculated in spreadsheets for each activity. These spreadsheets are available on CD.

Oil and Gas Wells Emissions Estimation

Criteria pollutant emissions from oil, coalbed natural gas, and conventional natural gas wells development were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions from coalbed natural gas and conventional natural gas wells include the following:

- Fugitive dust and combustive emissions from well pad construction activities
- Fugitive dust and combustive emissions from road traffic
- Combustive emissions from natural gas-fired compressors
- Fugitive VOC emissions from well-site pneumatic pumps
- Fugitive dust and combustive emissions from separators, dehydrators, and water-tank heater operations
- Fugitive dust and combustive emissions from compressor station visits
- Fugitive dust and combustive emissions from well workover operations
- Fugitive dust and combustive emissions from well and pipeline visits for inspection and repair
- VOC emissions from tank condensate and truck loadout (for natural gas wells only)
- Fugitive dust and combustive emissions from road-maintenance activities
- Fugitive dust and combustive emissions from road and well reclamation activities.

Estimated emissions from oil wells include the following:

- Fugitive dust and combustive emissions from well pad construction activities
- Fugitive dust and combustive emissions from road traffic
- Fugitive dust and combustive emissions from well workover operations
- Fugitive dust and combustive emissions from well and pipeline visits for inspection and repair
- Fugitive dust and combustive emissions from road maintenance activities.

The estimated numbers of oil and gas wells are provided by the Kemmerer Field Office and shown in Table J-5 (this table accounts for net wells in operation and subtracts wells that have been abandoned).

Table J-5. Producing Oil and Gas Wells in the Planning Area

Well Type	Existing Wells 2001	2011 Operational Wells	2020 Operational Wells
Alternative A			
Coalbed Natural Gas	0	97	189
Natural Gas	590	866	1,118
Oil	572	520	468
Alternative B			
Coalbed Natural Gas	0	46	91
Natural Gas	590	748	878
Oil	572	516	461
Alternative C			
Coalbed Natural Gas	0	94	184
Natural Gas	590	868	1,122
Oil	572	520	469
Alternative D (Preferred Alternative)			
Coalbed Natural Gas	0	94	183
Natural Gas	590	864	1,115
Oil	572	520	468

Source: BLM 2006a. Includes only those wells on federal land or mineral estate.

Coal Mine Emission Estimation

Criteria pollutant emissions from coal mine operations were based on actual emissions for 2001 from Kemmerer Mine operations (Potter 2006), projected for the years 2011 and 2020 based on estimated future production (BLM 2006b). Note that emissions from the proposed surface coal mine in the Haystack area, which could be leased under Alternatives A, C and D, are not included in the estimate because there is not enough information at this time to reliably forecast production quantity, or when the coal mine might become active.

Trona Mining and Processing Emission Estimation

Criteria pollutant emissions from trona mining and processing operations were based on actual 2001 emissions from operations at the four trona mines and processing plants in the planning area (two operated by FMC Corporation, and one each by General Chemical and Solvay Minerals) (Bott 2006). Emissions for the years 2011 and 2020 were estimated to be the same as current emissions, based on projected production being essentially constant for the foreseeable future (CREG 2006; BLM 2006b).

Salable and Locatable Minerals Emission Estimation

Criteria pollutant emissions from salable and locatable minerals operations were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust emissions from sand and gravel or mineral processing
- Emissions from truck traffic on unpaved roads at the sand and gravel or mineral processing plant
- Emissions from batch-drop operations
- Fugitive dust and combustive emissions from development and reclamation activities.

Renewable Energy Emissions Estimation

Criteria pollutant emissions from renewable energy activities were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from wind-energy development
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Livestock Grazing Emissions Estimation

Criteria pollutant emissions from livestock grazing operations were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from construction of springs, reservoirs and pits, wells, pipelines, fences, and reservoir maintenance
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Vegetation Emissions Estimation

Criteria pollutant emissions from vegetation operations were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from vegetative mechanical treatments (excluding hand work)
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Fire-Management Emissions Estimation

Criteria pollutant emissions from fire-management activities were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from mechanical treatments (hand work) and prescribed fire
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Forest and Woodlands Emissions Estimation

Criteria pollutant emissions from forest and woodlands activities were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from silviculture treatments
- Fugitive dust emissions from commuting vehicles on unpaved roads
- Combustive emissions from commuting vehicles on unpaved and paved roads.

Rights-of-Way Corridors Emissions Estimation

Criteria pollutant emissions from rights-of-way corridors operations were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include the following:

- Fugitive dust and combustive emissions from construction of roads, telephone and fiber optics, powerlines, pipelines (mineral/water), communication sites, and other facilities
- Fugitive dust and combustive emissions for commuting vehicle road traffic.

Off-Highway Vehicles Emission Estimation

Criteria pollutant emissions from off-highway vehicles were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Off-highway vehicles include all terrain vehicles, motorcycles, and snowmobiles.

Road Maintenance Emission Estimation

Criteria pollutant emissions from road maintenance activities (excluding well road maintenance) were calculated based on data provided by the Kemmerer Field Office and used best available information, BACT, AP-42, and the emission studies from other BLM documents. Estimated emissions include fugitive dust and combustive emissions resulting from the use of a grader. It was assumed that road maintenance would occur twice in the summer and once in the winter.

Summary of Emissions for All BLM Activities

Tables J-6 through J-112 summarizes the projected total annual emissions by resource. In most cases, year 2011 and 2020 are presented. These years vary for select resources.

Table J-6. Summary of Output – Alternative A
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations [a]	4.00	4.00	22.21	0.04	44.43	22.21	3.55
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.01	0.01	0.07	0.00	0.06	0.00	0.00
Station Visits - Operations	3.82	0.57	0.02	0.00	0.19	0.01	0.00
Well Workover - Operations	1.07	0.17	0.22	0.00	0.05	0.01	0.00
Well & Pipeline visits for Inspection & Repair - Operations	2.44	0.36	0.01	0.00	0.12	0.01	0.00
Sub-total: Operations	**11.33**	**5.11**	**22.53**	**0.05**	**44.86**	**22.25**	**3.56**
Road Maintenance	0.34	0.04	0.09	0.00	0.02	0.01	0.00
Sub-total: Maintenance	**0.34**	**0.04**	**0.09**	**0.00**	**0.02**	**0.01**	**0.00**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**19.07**	**6.50**	**27.41**	**0.21**	**45.95**	**22.56**	**3.59**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-7. Summary of Output – Alternative A
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations[a]	9.87	9.87	54.83	0.11	109.65	54.83	8.77
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.01	0.01	0.18	0.00	0.15	0.01	0.00
Station Visits - Operations	9.43	1.41	0.02	0.00	0.19	0.01	0.001
Well Workover - Operations	2.06	0.31	0.02	0.00	0.01	0.01	0.001
Well & Pipeline visits for Inspection & Repair - Operations	4.75	0.71	0.02	0.00	0.24	0.02	0.002
Sub-total: Operations	**26.12**	**12.31**	**55.06**	**0.12**	**110.25**	**54.87**	**8.78**
Road Maintenance	0.66	0.06	0.01	0.001	0.01	0.01	0.001
Sub-total: Maintenance	**0.66**	**0.06**	**0.01**	**0.001**	**0.01**	**0.01**	**0.001**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**34.18**	**13.73**	**59.86**	**0.27**	**111.33**	**55.18**	**8.81**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-8. Summary of Output – Alternative B
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	2.67	0.40	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.11	0.11	2.21	0.07	0.46	0.13	0.01
Commuting Vehicles - Construction	0.64	0.10	0.02	0.00	0.05	0.01	0.00
Sub-total: Construction	**3.43**	**0.61**	**2.23**	**0.07**	**0.51**	**0.14**	**0.01**
Natural Gas Compression - Operations [a]	1.94	1.94	10.78	0.02	21.56	10.78	1.72
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.00	0.00	0.03	0.00	0.03	0.00	0.00
Station Visits - Operations	1.85	0.28	0.01	0.00	0.09	0.01	0.00
Well Workover - Operations	0.51	0.08	0.10	0.00	0.02	0.01	0.00
Well & Pipeline visits for Inspection & Repair - Operations	1.16	0.17	0.01	0.00	0.06	0.00	0.00
Sub-total: Operations	**5.46**	**2.47**	**10.93**	**0.02**	**21.77**	**10.80**	**1.73**
Road Maintenance	0.16	0.02	0.04	0.00	0.01	0.00	0.00
Sub-total: Maintenance	**0.16**	**0.02**	**0.04**	**0.00**	**0.01**	**0.00**	**0.00**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**9.10**	**3.14**	**13.20**	**0.10**	**22.28**	**10.94**	**1.74**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-9. Summary of Output – Alternative B
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	2.67	0.40	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.11	0.11	2.21	0.07	0.46	0.13	0.01
Commuting Vehicles - Construction	0.64	0.10	0.02	0.00	0.05	0.01	0.00
Sub-total: Construction	**3.43**	**0.61**	**2.23**	**0.07**	**0.51**	**0.14**	**0.01**
Natural Gas Compression - Operations [a]	4.67	4.67	25.94	0.05	51.89	25.94	4.15
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.01	0.01	0.08	0.00	0.07	0.00	0.00
Station Visits - Operations	4.46	0.67	0.01	0.00	0.09	0.01	0.001
Well Workover - Operations	0.99	0.15	0.01	0.00	0.01	0.00	0.000
Well & Pipeline visits for Inspection & Repair - Operations	2.29	0.34	0.01	0.00	0.12	0.01	0.001
Sub-total: Operations	**12.42**	**5.84**	**26.05**	**0.06**	**52.17**	**25.97**	**4.15**
Road Maintenance	0.32	0.03	0.01	0.000	0.00	0.00	0.000
Sub-total: Maintenance	**0.32**	**0.03**	**0.01**	**0.000**	**0.00**	**0.00**	**0.000**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**16.21**	**6.52**	**28.29**	**0.13**	**52.68**	**26.11**	**4.17**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-10. Summary of Output – Alternative C
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations[a]	3.78	3.78	21.01	0.04	42.01	21.01	3.36
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.01	0.01	0.07	0.00	0.06	0.00	0.00
Station Visits - Operations	3.61	0.54	0.02	0.00	0.18	0.01	0.00
Well Workover - Operations	1.03	0.16	0.22	0.00	0.05	0.01	0.00
Well & Pipeline visits for Inspection & Repair - Operations	2.36	0.35	0.01	0.00	0.12	0.01	0.00
Sub-total: Operations	**10.79**	**4.84**	**21.32**	**0.05**	**42.43**	**21.04**	**3.36**
Road Maintenance	0.33	0.04	0.09	0.00	0.02	0.01	0.00
Sub-total: Maintenance	**0.33**	**0.04**	**0.09**	**0.00**	**0.02**	**0.01**	**0.00**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**18.52**	**6.23**	**26.20**	**0.20**	**43.52**	**21.35**	**3.40**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-11. Summary of Output – Alternative C
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations [a]	9.56	9.56	53.08	0.11	106.17	53.08	8.49
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.01	0.01	0.17	0.00	0.14	0.01	0.00
Station Visits - Operations	9.13	1.37	0.02	0.00	0.18	0.01	0.001
Well Workover - Operations	2.01	0.30	0.02	0.00	0.01	0.01	0.001
Well & Pipeline visits for Inspection & Repair - Operations	4.62	0.69	0.02	0.00	0.24	0.02	0.002
Sub-total: Operations	**25.32**	**11.93**	**53.31**	**0.11**	**106.74**	**53.13**	**8.50**
Road Maintenance	0.64	0.06	0.01	0.001	0.01	0.01	0.001
Sub-total: Maintenance	**0.64**	**0.06**	**0.01**	**0.001**	**0.01**	**0.01**	**0.001**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**33.36**	**13.34**	**58.11**	**0.27**	**107.83**	**53.43**	**8.53**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-12. Summary of Output – Alternative D (Preferred Alternative) Total Annual Emissions from Coalbed Natural Gas Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations [a]	3.78	3.78	21.01	0.04	42.01	21.01	3.36
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.01	0.01	0.07	0.00	0.06	0.00	0.00
Station Visits - Operations	3.61	0.54	0.02	0.00	0.18	0.01	0.00
Well Workover - Operations	1.03	0.16	0.22	0.00	0.05	0.01	0.00
Well & Pipeline visits for Inspection & Repair - Operations	2.36	0.35	0.01	0.00	0.12	0.01	0.00
Sub-total: Operations	**10.79**	**4.84**	**21.32**	**0.05**	**42.43**	**21.04**	**3.36**
Road Maintenance	0.33	0.04	0.09	0.00	0.02	0.01	0.00
Sub-total: Maintenance	**0.33**	**0.04**	**0.09**	**0.00**	**0.02**	**0.01**	**0.00**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**18.52**	**6.23**	**26.20**	**0.20**	**43.52**	**21.35**	**3.40**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-13. Summary of Output – Alternative D (Preferred Alternative)
Total Annual Emissions from Coalbed Natural Gas Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	5.73	0.86	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.24	0.24	4.75	0.15	0.97	0.28	0.03
Commuting Vehicles - Construction	1.38	0.21	0.04	0.01	0.10	0.02	0.00
Sub-total: Construction	**7.35**	**1.31**	**4.78**	**0.16**	**1.07**	**0.30**	**0.03**
Natural Gas Compression - Operations[a]	9.55	9.55	53.06	0.11	106.11	53.06	8.49
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.01	0.01	0.17	0.00	0.14	0.01	0.00
Station Visits - Operations	9.12	1.37	0.02	0.00	0.18	0.01	0.001
Well Workover - Operations	2.00	0.30	0.02	0.00	0.01	0.01	0.001
Well & Pipeline visits for Inspection & Repair - Operations	4.60	0.69	0.02	0.00	0.23	0.02	0.002
Sub-total: Operations	**25.28**	**11.92**	**53.28**	**0.11**	**106.69**	**53.10**	**8.49**
Road Maintenance	0.63	0.06	0.01	0.001	0.01	0.01	0.001
Sub-total: Maintenance	**0.63**	**0.06**	**0.01**	**0.001**	**0.01**	**0.01**	**0.001**
Road Reclamation	0.04	0.04	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.06**	**0.04**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**33.32**	**13.33**	**58.08**	**0.27**	**107.77**	**53.41**	**8.52**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-14. Summary of Output – Alternative A
Total Annual Emissions from Natural Gas Wells – Year 2001

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	10.36	1.55	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	6.78	6.78	140.92	3.03	45.59	11.50	1.15
Well Completion Flaring	0.14	0.14	1.30	55.66	7.08	63.22	6.32
Commuting Vehicles - Construction	16.18	2.73	1.77	0.35	4.57	1.07	0.11
Sub-total: Construction	**33.46**	**11.21**	**143.99**	**59.04**	**57.23**	**75.78**	**7.58**
Natural Gas Compression & Pneumatic Pumps - Operations [a]	8.91	8.91	134.91	0.27	269.82	136.72	21.77
Separator, Dehydrator & Water Tank Heaters - Operations [a]	44.68	44.68	587.86	3.53	493.80	5,410.86	541.09
Station Visits - Operations	8.57	1.28	0.04	0.00	0.44	0.03	0.00
Well Workover - Operations	0.17	0.06	1.51	0.01	0.30	0.06	0.01
Well & Pipeline visits for Inspection & Repair - Operations	15.25	2.29	0.07	0.01	0.78	0.05	0.00
Tanks Condensate and Loadout	---	---	---	---	---	523.90	52.39
Sub-total: Operations	**77.58**	**57.22**	**724.38**	**3.82**	**765.14**	**6,071.62**	**615.26**
Road Maintenance	2.64	0.32	1.48	0.03	0.49	0.12	0.01
Sub-total: Maintenance	**2.64**	**0.32**	**1.48**	**0.03**	**0.49**	**0.12**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**113.70**	**68.76**	**869.86**	**62.88**	**822.86**	**6,147.52**	**622.85**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-15. Summary of Output – Alternative A
Total Annual Emissions from Natural Gas Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.56	66.93	8.51	76.02	7.60
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.44**	**214.63**	**73.94**	**49.60**	**87.62**	**8.76**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	12.70	12.70	192.29	0.38	384.59	194.87	31.02
Separator, Dehydrator & Water Tank Heaters - Operations[a]	63.64	63.64	837.33	5.02	703.36	4,485.97	448.60
Station Visits - Operations	12.22	1.83	0.05	0.01	0.62	0.04	0.00
Well Workover - Operations	0.35	0.13	3.13	0.02	0.63	0.13	0.01
Well & Pipeline visits for Inspection & Repair - Operations	21.74	3.26	0.10	0.01	1.11	0.07	0.01
Tanks Condensate and Loadout	---	---	---	---	---	432.47	43.25
Sub-total: Operations	**110.65**	**81.56**	**1,032.90**	**5.44**	**1,090.30**	**5,113.54**	**522.89**
Road Maintenance	3.70	0.40	1.03	0.01	0.24	0.09	0.01
Sub-total: Maintenance	**3.70**	**0.40**	**1.03**	**0.01**	**0.24**	**0.09**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**176.93**	**98.40**	**1,248.57**	**79.39**	**1,140.15**	**5,201.25**	**531.66**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-16. Summary of Output – Alternative A
Total Annual Emissions from Natural Gas Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.56	66.93	8.51	76.02	7.60
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.44**	**214.63**	**73.94**	**49.60**	**87.62**	**8.76**
Natural Gas Compression & Pneumatic Pumps - Operations [a]	16.40	16.40	248.32	0.50	496.64	251.64	40.06
Separator, Dehydrator & Water Tank Heaters - Operations [a]	82.16	82.16	1081.09	6.49	908.11	4563.77	456.38
Station Visits - Operations	15.78	2.36	0.07	0.01	0.80	0.05	0.005
Well Workover - Operations	0.27	0.05	0.21	0.02	0.07	0.10	0.010
Well & Pipeline visits for Inspection & Repair - Operations	28.08	4.21	0.12	0.01	1.43	0.09	0.009
Tanks Condensate and Loadout	---	---	---	---	---	438.74	43.87
Sub-total: Operations	**142.68**	**105.18**	**1329.81**	**7.02**	**1407.06**	**5254.39**	**540.34**
Road Maintenance	4.73	0.46	0.09	0.007	0.06	0.04	0.004
Sub-total: Maintenance	**4.73**	**0.46**	**0.09**	**0.007**	**0.06**	**0.04**	**0.004**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**209.98**	**122.09**	**1,544.54**	**80.97**	**1,456.72**	**5,342.05**	**549.10**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-17. Summary of Output – Alternative B
Total Annual Emissions from Natural Gas Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	15.12	2.27	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	5.20	5.20	147.51	4.43	22.28	6.61	0.66
Well Completion Flaring	0.11	0.11	0.99	42.26	5.37	48.00	4.80
Commuting Vehicles - Construction	23.65	4.00	2.59	0.51	6.67	1.56	0.16
Sub-total: Construction	**44.08**	**11.58**	**151.08**	**47.20**	**34.33**	**56.17**	**5.62**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	10.96	10.96	166.03	0.33	332.05	168.25	26.79
Separator, Dehydrator & Water Tank Heaters - Operations[a]	54.94	54.94	722.88	4.34	607.22	3,476.36	347.64
Station Visits - Operations	10.55	1.58	0.05	0.01	0.54	0.03	0.00
Well Workover - Operations	0.25	0.09	2.20	0.01	0.44	0.09	0.01
Well & Pipeline visits for Inspection & Repair - Operations	18.77	2.81	0.08	0.01	0.96	0.06	0.01
Tanks Condensate and Loadout	---	---	---	---	---	334.74	33.47
Sub-total: Operations	**95.47**	**70.39**	**891.24**	**4.69**	**941.21**	**3,979.54**	**407.92**
Road Maintenance	3.20	0.35	0.89	0.00	0.21	0.08	0.01
Sub-total: Maintenance	**3.20**	**0.35**	**0.89**	**0.00**	**0.21**	**0.08**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**142.77**	**82.31**	**1,043.22**	**51.90**	**975.75**	**4,035.79**	**413.54**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-18. Summary of Output – Alternative B
Total Annual Emissions from Natural Gas Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	15.12	2.27	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	5.20	5.20	147.51	4.43	22.28	6.61	0.66
Well Completion Flaring	0.11	0.11	0.99	42.26	5.37	48.00	4.80
Commuting Vehicles - Construction	23.65	4.00	2.59	0.51	6.67	1.56	0.16
Sub-total: Construction	**44.08**	**11.58**	**151.08**	**47.20**	**34.33**	**56.17**	**5.62**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	12.88	12.88	195.01	0.39	390.01	197.61	31.46
Separator, Dehydrator & Water Tank Heaters - Operations[a]	64.51	64.51	848.88	5.09	713.06	3076.36	307.64
Station Visits - Operations	12.39	1.86	0.05	0.01	0.63	0.04	0.004
Well Workover - Operations	0.19	0.03	0.15	0.01	0.05	0.07	0.007
Well & Pipeline visits for Inspection & Repair - Operations	22.05	3.30	0.10	0.01	1.12	0.07	0.007
Tanks Condensate and Loadout	---	---	---	---	---	295.11	29.51
Sub-total: Operations	**112.02**	**82.58**	**1044.18**	**5.51**	**1104.88**	**3569.26**	**368.63**
Road Maintenance	3.71	0.36	0.07	0.005	0.04	0.03	0.003
Sub-total: Maintenance	**3.71**	**0.36**	**0.07**	**0.005**	**0.04**	**0.03**	**0.003**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**159.83**	**94.53**	**1,195.34**	**52.72**	**1,139.25**	**3,625.47**	**374.25**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-19. Summary of Output – Alternative C
Total Annual Emissions from Natural Gas Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.57	67.01	8.52	76.11	7.61
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.44**	**214.63**	**74.02**	**49.61**	**87.71**	**8.77**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	12.72	12.72	192.68	0.39	385.35	195.25	31.09
Separator, Dehydrator & Water Tank Heaters - Operations[a]	63.76	63.76	839.00	5.03	704.76	4,500.22	450.02
Station Visits - Operations	12.24	1.83	0.05	0.01	0.62	0.04	0.00
Well Workover - Operations	0.35	0.13	3.13	0.02	0.63	0.13	0.01
Well & Pipeline visits for Inspection & Repair - Operations	21.79	3.26	0.10	0.01	1.11	0.07	0.01
Tanks Condensate and Loadout	---	---	---	---	---	433.85	43.39
Sub-total: Operations	**110.87**	**81.72**	**1,034.95**	**5.45**	**1,092.47**	**5,129.56**	**524.52**
Road Maintenance	3.71	0.40	1.04	0.01	0.24	0.09	0.01
Sub-total: Maintenance	**3.71**	**0.40**	**1.04**	**0.01**	**0.24**	**0.09**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**177.15**	**98.57**	**1,250.62**	**79.48**	**1,142.32**	**5,217.36**	**533.30**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-20. Summary of Output – Alternative C
Total Annual Emissions from Natural Gas Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.57	67.01	8.52	76.11	7.61
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.44**	**214.63**	**74.02**	**49.61**	**87.71**	**8.77**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	16.45	16.45	249.09	0.50	498.17	252.42	40.19
Separator, Dehydrator & Water Tank Heaters - Operations[a]	82.42	82.42	1084.41	6.51	910.91	4585.16	458.52
Station Visits - Operations	15.83	2.37	0.07	0.01	0.81	0.05	0.005
Well Workover - Operations	0.27	0.05	0.21	0.02	0.07	0.10	0.010
Well & Pipeline visits for Inspection & Repair - Operations	28.16	4.22	0.12	0.01	1.43	0.09	0.009
Tanks Condensate and Loadout	---	---	---	---	---	440.81	44.08
Sub-total: Operations	**143.12**	**105.50**	**1333.90**	**7.04**	**1411.39**	**5278.63**	**542.81**
Road Maintenance	4.74	0.47	0.09	0.007	0.06	0.04	0.004
Sub-total: Maintenance	**4.74**	**0.47**	**0.09**	**0.007**	**0.06**	**0.04**	**0.004**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**210.44**	**122.41**	**1,548.63**	**81.07**	**1,461.06**	**5,366.38**	**551.58**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-21. Summary of Output – Alternative D (Preferred Alternative)
Total Annual Emissions from Natural Gas Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.56	66.82	8.49	75.90	7.59
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.44**	**214.63**	**73.83**	**49.59**	**87.50**	**8.75**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	12.66	12.66	191.78	0.38	383.57	194.35	30.94
Separator, Dehydrator & Water Tank Heaters - Operations[a]	63.47	63.47	835.11	5.01	701.49	4,467.01	446.70
Station Visits - Operations	12.18	1.83	0.05	0.01	0.62	0.04	0.00
Well Workover - Operations	0.35	0.13	3.13	0.02	0.63	0.13	0.01
Well & Pipeline visits for Inspection & Repair - Operations	21.68	3.25	0.10	0.01	1.10	0.07	0.01
Tanks Condensate and Loadout	---	---	---	---	---	430.64	43.06
Sub-total: Operations	**110.36**	**81.34**	**1,030.17**	**5.43**	**1,087.41**	**5,092.23**	**520.73**
Road Maintenance	3.69	0.40	1.03	0.01	0.24	0.09	0.01
Sub-total: Maintenance	**3.69**	**0.40**	**1.03**	**0.01**	**0.24**	**0.09**	**0.01**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total Emissions	**176.62**	**98.19**	**1,245.83**	**79.27**	**1,137.24**	**5,179.81**	**529.49**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-22. Summary of Output – Alternative D (Preferred Alternative) Total Annual Emissions from Natural Gas Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	21.43	3.21	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	7.38	7.38	209.39	6.29	31.62	9.39	0.94
Well Completion Flaring	0.17	0.17	1.56	66.82	8.49	75.90	7.59
Commuting Vehicles - Construction	33.57	5.67	3.67	0.72	9.47	2.21	0.22
Sub-total: Construction	**62.56**	**16.44**	**214.63**	**73.83**	**49.59**	**87.50**	**8.75**
Natural Gas Compression & Pneumatic Pumps - Operations[a]	16.35	16.35	247.59	0.50	495.19	250.90	39.95
Separator, Dehydrator & Water Tank Heaters - Operations[a]	81.92	81.92	1077.92	6.47	905.45	4551.90	455.19
Station Visits - Operations	15.73	2.36	0.07	0.01	0.80	0.05	0.005
Well Workover - Operations	0.27	0.05	0.21	0.02	0.07	0.10	0.010
Well & Pipeline visits for Inspection & Repair - Operations	27.99	4.19	0.12	0.01	1.42	0.09	0.009
Tanks Condensate and Loadout	---	---	---	---	---	437.60	43.76
Sub-total: Operations	**142.26**	**104.87**	**1325.91**	**7.00**	**1402.93**	**5240.64**	**538.92**
Road Maintenance	4.71	0.46	0.09	0.007	0.06	0.04	0.004
Sub-total: Maintenance	**4.71**	**0.46**	**0.09**	**0.007**	**0.06**	**0.04**	**0.004**
Road Reclamation	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Reclamation	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Reclamation	**0.01**	**0.00**	**0.00**	**0.0000**	**0.00**	**0.000**	**0.0000**
Total Emissions	**209.55**	**121.78**	**1,540.63**	**80.84**	**1,452.58**	**5,328.18**	**547.67**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1, and formaldehyde HAP added for gas compression

Table J-23. Summary of Output – Alternative A
Total Annual Emissions from Oil Wells – Year 2001

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.07	0.01	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.18	0.18	6.08	0.82	1.52	0.19	0.02
Well Completion Flaring	0.11	0.02	0.00	0.00	0.01	0.00	0.00
Sub-total: Construction	**0.36**	**0.21**	**6.08**	**0.82**	**1.53**	**0.19**	**0.02**
Natural Gas Compression - Operations [a]	0.00	0.00	---	---	---	---	---
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.01	0.01	0.15	0.01	0.03	0.01	0.00
Station Visits - Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Workover - Operations	3.47	0.52	0.02	0.00	0.18	0.01	0.00
Sub-total: Operations	**3.48**	**0.53**	**0.17**	**0.01**	**0.21**	**0.02**	**0.00**
Road Maintenance	2.52	0.34	1.19	0.15	0.27	0.06	0.01
Sub-total: Maintenance	**2.52**	**0.34**	**1.19**	**0.15**	**0.27**	**0.06**	**0.01**
Total Emissions	**6.37**	**1.08**	**7.44**	**0.97**	**2.01**	**0.27**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-24. Summary of Output – Alternative A
Total Annual Emissions from Oil Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Well Completion Flaring	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Natural Gas Compression - Operations [a]	0.00	0.00	---	---	---	---	---
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Station Visits - Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Workover - Operations	3.15	0.47	0.01	0.00	0.16	0.01	0.00
Sub-total: Operations	**3.17**	**0.49**	**0.33**	**0.02**	**0.23**	**0.04**	**0.00**
Road Maintenance	2.29	0.31	1.08	0.13	0.25	0.06	0.01
Sub-total: Maintenance	**2.29**	**0.31**	**1.08**	**0.13**	**0.25**	**0.06**	**0.01**
Total Emissions	**6.22**	**1.24**	**14.04**	**1.85**	**3.64**	**0.48**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-25. Summary of Output – Alternative A
Total Annual Emissions from Oil Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Well Completion Flaring	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Natural Gas Compression - Operations [a]	0.00	0.00	---	---	---	---	---
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Station Visits - Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Well Workover - Operations	2.83	0.42	0.01	0.00	0.14	0.01	0.001
Sub-total: Operations	**2.86**	**0.45**	**0.33**	**0.02**	**0.21**	**0.03**	**0.00**
Road Maintenance	3.38	0.46	1.59	0.195	0.36	0.08	0.008
Sub-total: Maintenance	**3.38**	**0.46**	**1.59**	**0.195**	**0.36**	**0.08**	**0.008**
Total Emissions	**7.00**	**1.34**	**14.55**	**1.91**	**3.74**	**0.51**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-26. Summary of Output – Alternative B
Total Annual Emissions from Oil Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.10	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.27	0.27	8.89	1.19	2.22	0.27	0.03
Well Completion Flaring	0.17	0.03	0.00	0.00	0.01	0.00	0.00
Sub-total: Construction	**0.53**	**0.31**	**8.90**	**1.19**	**2.23**	**0.27**	**0.03**
Natural Gas Compression - Operations[a]	0.00	0.00	---	---	---	---	---
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.02	0.02	0.22	0.01	0.05	0.02	0.00
Station Visits - Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Workover - Operations	3.12	0.47	0.01	0.00	0.16	0.01	0.00
Sub-total: Operations	**3.14**	**0.48**	**0.23**	**0.02**	**0.21**	**0.03**	**0.00**
Road Maintenance	2.27	0.31	1.07	0.13	0.24	0.05	0.01
Sub-total: Maintenance	**2.27**	**0.31**	**1.07**	**0.13**	**0.24**	**0.05**	**0.01**
Total Emissions	**5.95**	**1.10**	**10.20**	**1.34**	**2.68**	**0.36**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-27. Summary of Output – Alternative B
Total Annual Emissions from Oil Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.10	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.27	0.27	8.89	1.19	2.22	0.27	0.03
Well Completion Flaring	0.17	0.03	0.00	0.00	0.01	0.00	0.00
Sub-total: Construction	**0.53**	**0.31**	**8.90**	**1.19**	**2.23**	**0.27**	**0.03**
Natural Gas Compression - Operations [a]	0.00	0.00	---	---	---	---	---
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.02	0.02	0.22	0.01	0.05	0.02	0.00
Station Visits - Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Well Workover - Operations	2.79	0.42	0.01	0.00	0.14	0.01	0.001
Sub-total: Operations	**2.81**	**0.43**	**0.23**	**0.02**	**0.19**	**0.03**	**0.00**
Road Maintenance	3.33	0.45	1.57	0.192	0.36	0.08	0.008
Sub-total: Maintenance	**3.33**	**0.45**	**1.57**	**0.192**	**0.36**	**0.08**	**0.008**
Total Emissions	**6.67**	**1.19**	**10.70**	**1.40**	**2.78**	**0.38**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-28. Summary of Output – Alternative C
Total Annual Emissions from Oil Wells – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Well Completion Flaring	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Natural Gas Compression - Operations[a]	0.00	0.00	---	---	---	---	---
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Station Visits - Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Workover - Operations	3.15	0.47	0.01	0.00	0.16	0.01	0.00
Sub-total: Operations	**3.17**	**0.49**	**0.33**	**0.02**	**0.23**	**0.04**	**0.00**
Road Maintenance	2.29	0.31	1.08	0.13	0.25	0.06	0.01
Sub-total: Maintenance	**2.29**	**0.31**	**1.08**	**0.13**	**0.25**	**0.06**	**0.01**
Total Emissions	**6.22**	**1.24**	**14.04**	**1.85**	**3.64**	**0.48**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-29. Summary of Output – Alternative C
Total Annual Emissions from Oil Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions[a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Well Completion Flaring	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Natural Gas Compression - Operations[a]	0.00	0.00	---	---	---	---	---
Separator, Dehydrator & Water Tank Heaters - Operations[a]	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Station Visits - Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Well Workover - Operations	2.84	0.42	0.01	0.00	0.14	0.01	0.001
Sub-total: Operations	**2.86**	**0.45**	**0.33**	**0.02**	**0.21**	**0.03**	**0.00**
Road Maintenance	3.38	0.46	1.59	0.195	0.36	0.08	0.008
Sub-total: Maintenance	**3.38**	**0.46**	**1.59**	**0.195**	**0.36**	**0.08**	**0.008**
Total Emissions	**7.00**	**1.34**	**14.55**	**1.91**	**3.74**	**0.51**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-30. Summary of Output - Alternative D (Preferred Alternative) Total Annual Emissions from Oil Wells – Year 2011

	Annual Emissions (Tons)						
Activity	**PM_{10}**	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Well Completion Flaring	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Natural Gas Compression - Operations [a]	0.00	0.00	---	---	---	---	---
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Station Visits - Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Well Workover - Operations	3.14	0.47	0.01	0.00	0.16	0.01	0.00
Sub-total: Operations	**3.17**	**0.49**	**0.33**	**0.02**	**0.23**	**0.04**	**0.00**
Road Maintenance	2.29	0.31	1.08	0.13	0.25	0.06	0.01
Sub-total: Maintenance	**2.29**	**0.31**	**1.08**	**0.13**	**0.25**	**0.06**	**0.01**
Total Emissions	**6.22**	**1.24**	**14.04**	**1.85**	**3.64**	**0.48**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-31. Summary of Output – Alternative D (Preferred Alternative)
Total Annual Emissions from Oil Wells – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Well Pad & Station Construction - Fugitive Dust	0.14	0.02	---	---	---	---	---
Heavy Equipment Combustive Emissions [a]	0.38	0.38	12.63	1.69	3.15	0.39	0.04
Well Completion Flaring	0.24	0.04	0.01	0.00	0.02	0.00	0.00
Sub-total: Construction	**0.76**	**0.44**	**12.63**	**1.70**	**3.17**	**0.39**	**0.04**
Natural Gas Compression - Operations [a]	0.00	0.00	---	---	---	---	---
Separator, Dehydrator & Water Tank Heaters - Operations [a]	0.02	0.02	0.31	0.02	0.07	0.03	0.00
Station Visits - Operations	0.00	0.00	0.00	0.00	0.00	0.00	0.000
Well Workover - Operations	2.83	0.42	0.01	0.00	0.14	0.01	0.001
Sub-total: Operations	**2.86**	**0.45**	**0.33**	**0.02**	**0.21**	**0.03**	**0.00**
Road Maintenance	3.38	0.46	1.59	0.195	0.36	0.08	0.008
Sub-total: Maintenance	**3.38**	**0.46**	**1.59**	**0.195**	**0.36**	**0.08**	**0.008**
Total Emissions	**7.00**	**1.34**	**14.55**	**1.91**	**3.74**	**0.51**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants, assumed = VOCs*0.1

Table J-32. All Alternatives
Total Annual Emissions from Coal Mining Operations

	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Total Emissions - 2001	**407.1**	**142.1**	**1320.3**	**1.5**	**285.1**	**0**	**0**
Total Emissions - 2011, 2020	**452.3**	**157.9**	**1467.0**	**1.7**	**316.8**	**0**	**0**

Source: Potter 2006; Easley 2006

[a] $PM_{2.5}$ = PM_{10} * 0.349 for this source (EPA 1999)

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note the following assumptions:

1. Emissions for PM10, NOx, SOx, CO, VOCs and HAPs are actual emissions from 2001 as reported by Potter (2006).
2. PM2.5 emissions are not included in Potter (2006). PM2.5 emissions are estimated based on the ratio of PM2.5 to PM10 emissions for this mine as reported by EPA (1999).
3. Future emissions are estimated based on ratio of current to future production (current = 4.5 million tons/yr, future = 5.0 million tons/yr). Easley (2006) provided the production info, and MacDonald (2006) provided the method for projecting emissions.

Table J-33. All Alternatives
Total Annual Emissions from Trona Mining and Processing Operations – 2001

	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[a]
FMC Granger	65.50	65.50	495.20	107.00	635.70	183.00	1.05
FMC Wyoming Green River Soda Ash facility	870.40	870.40	258.80	0.00	105.70	251.00	109.70
General Chemical	838.90	838.90	2810.10	4896.20	238.50	5103.50	127.70
Solvay	159.30	159.30	1291.00	40.10	3509.80	1667.20	234.80
Total Emissions	**1934.10**	**1934.10**	**4855.10**	**5043.30**	**4489.70**	**7204.70**	**473.25**

Source: Bott 2006

[a] HAPs = Hazardous Air Pollutants

Note the following assumptions:

1. Emissions for PM2.5 assumed equal to PM10.
2. Emissions for PM10, NOx, SO2, CO, VOCs, HAPs reported by Bott 2006.
3. Emissions projected constant for 2011 and 2020 based on no projected change in trona production (CREG 2006).

Table J-34. Summary of Output – Alternative A
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2001

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.50	0.50	10.40	0.22	3.35	0.84	0.08
Total	**289.59**	**34.00**	**20.35**	**0.23**	**3.41**	**0.86**	**0.09**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-35. Summary of Output – Alternative A
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles – Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment – Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment – Combustive	0.16	0.16	5.00	0.02	1.15	0.33	0.03
Total	**289.26**	**33.67**	**14.95**	**0.03**	**1.21**	**0.35**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-36. Summary of Output – Alternative A
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.35	0.02	0.12	0.16	0.02
Total	**289.11**	**33.52**	**10.29**	**0.03**	**0.18**	**0.18**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-37. Summary of Output – Alternative B
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	232.83	25.61	9.23	---	---	---	---
Unpaved Roads	0.73	0.11	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.00	0.06	0.02	0.00
Batch Drop Operations	0.84	0.27	---	---	---	---	---
Heavy Equipment - Dust	35.43	5.31	---	---	---	---	---
Heavy Equipment - Combustive	0.15	0.15	4.65	0.02	1.07	0.31	0.03
Total	**269.98**	**31.45**	**13.90**	**0.03**	**1.12**	**0.32**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-38. Summary of Output – Alternative B
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	232.83	25.61	9.23	---	---	---	---
Unpaved Roads	0.73	0.11	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.00	0.06	0.02	0.00
Batch Drop Operations	0.84	0.27	---	---	---	---	---
Heavy Equipment - Dust	35.43	5.31	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.32	0.02	0.11	0.15	0.02
Total	**269.84**	**31.32**	**9.57**	**0.03**	**0.17**	**0.17**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-39. Summary of Output – Alternative C
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles – Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment – Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment – Combustive	0.16	0.16	5.00	0.02	1.15	0.33	0.03
Total	**289.26**	**33.67**	**14.95**	**0.03**	**1.21**	**0.35**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-40. Summary of Output – Alternative C
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.35	0.02	0.12	0.16	0.02
Total	**289.11**	**33.52**	**10.29**	**0.03**	**0.18**	**0.18**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-41. Summary of Output – Alternative D (Preferred Alternative)
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.16	0.16	5.00	0.02	1.15	0.33	0.03
Total	**289.26**	**33.67**	**14.95**	**0.03**	**1.21**	**0.35**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-42. Summary of Output – Alternative D (Preferred Alternative)
Annual Emissions Estimation for Salable Minerals Equipment Usage – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Sand Handling, Transfer, and Storage	250.35	27.54	9.92	---	---	---	---
Unpaved Roads	0.78	0.12	---	---	---	---	---
Commuting Vehicles - Exhaust	0.01	0.01	0.03	0.01	0.06	0.02	0.00
Batch Drop Operations	0.91	0.29	---	---	---	---	---
Heavy Equipment - Dust	37.05	5.56	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.35	0.02	0.12	0.16	0.02
Total	**289.11**	**33.52**	**10.29**	**0.03**	**0.18**	**0.18**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-43. Summary of Output – Alternative A
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2001

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.87	0.87	17.09	0.37	5.70	1.45	0.15
Total	**1.22**	**0.96**	**17.28**	**0.41**	**6.11**	**1.57**	**0.16**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-44. Summary of Output – Alternative A
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.29	0.29	8.88	0.04	1.95	0.44	0.04
Total	**0.63**	**0.37**	**9.08**	**0.08**	**2.36**	**0.56**	**0.06**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-45. Summary of Output – Alternative A
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.02	0.02	0.58	0.04	0.19	0.27	0.03
Total	**0.37**	**0.11**	**0.78**	**0.08**	**0.60**	**0.39**	**0.04**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-46. Summary of Output – Alternative B
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.15	0.02	---	---	---	---	---
Commuting - Exhaust	0.02	0.02	0.10	0.02	0.21	0.06	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.14	0.14	4.44	0.02	0.97	0.22	0.02
Total	**0.32**	**0.19**	**4.54**	**0.04**	**1.18**	**0.28**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-47. Summary of Output – Alternative B
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.15	0.02	---	---	---	---	---
Commuting - Exhaust	0.02	0.02	0.10	0.02	0.21	0.06	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.29	0.02	0.09	0.13	0.01
Total	**0.18**	**0.05**	**0.39**	**0.04**	**0.30**	**0.19**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-48. Summary of Output – Alternative C
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.29	0.29	8.88	0.04	1.95	0.44	0.04
Total	**0.63**	**0.37**	**9.08**	**0.08**	**2.36**	**0.56**	**0.06**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1
[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-49. Summary of Output – Alternative C
Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$[a]	NO_x	SO_2	CO	VOC	HAPs[b]
Product Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.30	0.04	---	---	---	---	---
Commuting - Exhaust	0.05	0.04	0.20	0.04	0.42	0.12	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.02	0.02	0.58	0.04	0.19	0.27	0.03
Total	**0.37**	**0.11**	**0.78**	**0.08**	**0.60**	**0.39**	**0.04**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1
[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-50. Summary of Output – Alternative D (Preferred Alternative) Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$[a]**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Sand Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.15	0.02	---	---	---	---	---
Commuting - Exhaust	0.02	0.02	0.10	0.02	0.21	0.06	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.14	0.14	4.44	0.02	0.97	0.22	0.02
Total	**0.32**	**0.19**	**4.54**	**0.04**	**1.18**	**0.28**	**0.03**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-51. Summary of Output – Alternative D (Preferred Alternative) Annual Emissions Estimation for Locatable Minerals Equipment Usage – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$[a]**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Sand Handling, Transfer, and Storage[c]	---	---	---	---	---	---	---
Unpaved Roads	0.15	0.02	---	---	---	---	---
Commuting - Exhaust	0.02	0.02	0.10	0.02	0.21	0.06	0.01
Heavy Equipment - Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Combustive	0.01	0.01	0.29	0.02	0.09	0.13	0.01
Total	**0.18**	**0.05**	**0.39**	**0.04**	**0.30**	**0.19**	**0.02**

[a] Emission factor for $PM_{2.5}$ = PM_{10} for combustive emissions.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

[c] Handling (including batch drop), transfer, and storage does not apply since locatable operations are primarily building stone.

Table J-52. Summary of Output – Alternative A
Total Annual Emissions from Renewable Energy Development – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.43	0.01	0.32	0.07	0.01
Sub-total: Heavy Equipment	**1,170.05**	**175.55**	**1.43**	**0.01**	**0.32**	**0.07**	**0.01**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.90**	**178.75**	**1.91**	**0.10**	**1.75**	**0.36**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-53. Summary of Output – Alternative A
Total Annual Emissions from Renewable Energy Development – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.00	0.00	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Commuting Vehicles	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-54. Summary of Output – Alternative B
Total Annual Emissions from Renewable Energy Development – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.43	0.01	0.32	0.07	0.01
Sub-total: Heavy Equipment	**1,170.05**	**175.55**	**1.43**	**0.01**	**0.32**	**0.07**	**0.01**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.90**	**178.75**	**1.91**	**0.10**	**1.75**	**0.36**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-55. Summary of Output – Alternative B
Total Annual Emissions from Renewable Energy Development – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.00	0.00	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Commuting Vehicles	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-56. Summary of Output – Alternative C
Total Annual Emissions from Renewable Energy Development – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.43	0.01	0.32	0.07	0.01
Sub-total: Heavy Equipment	**1,170.05**	**175.55**	**1.43**	**0.01**	**0.32**	**0.07**	**0.01**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.90**	**178.75**	**1.91**	**0.10**	**1.75**	**0.36**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-57. Summary of Output – Alternative C
Total Annual Emissions from Renewable Energy Development – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.09	0.01	0.03	0.04	0.00
Sub-total: Heavy Equipment	**1,170.00**	**175.50**	**0.09**	**0.01**	**0.03**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.86**	**178.71**	**0.57**	**0.10**	**1.46**	**0.33**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-58. Summary of Output – Alternative D (Preferred Alternative) Total Annual Emissions from Renewable Energy Development – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Heavy Equipment - Fugitive Dust	1,170.00	175.50	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.43	0.01	0.32	0.07	0.01
Sub-total: Heavy Equipment	**1,170.05**	**175.55**	**1.43**	**0.01**	**0.32**	**0.07**	**0.01**
Commuting Vehicles - Fugitive Dust	20.75	3.10	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.11	0.10	0.48	0.09	1.43	0.29	0.03
Sub-total: Commuting Vehicles	**20.86**	**3.20**	**0.48**	**0.09**	**1.43**	**0.29**	**0.03**
Total	**1,190.90**	**178.75**	**1.91**	**0.10**	**1.75**	**0.36**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-59. Summary of Output – Alternative D (Preferred Alternative) Total Annual Emissions from Renewable Energy Development – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Fugitive Dust	585.00	87.75	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.05	0.00	0.02	0.02	0.00
Sub-total: Heavy Equipment	**585.00**	**87.75**	**0.05**	**0.00**	**0.02**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	10.92	1.63	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.06	0.05	0.25	0.05	0.75	0.15	0.02
Sub-total: Commuting Vehicles	**10.98**	**1.69**	**0.25**	**0.05**	**0.75**	**0.15**	**0.02**
Total	**595.98**	**89.44**	**0.30**	**0.05**	**0.77**	**0.17**	**0.02**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Note: For alternatives A and B, the one activity is assigned to year 2011 for analysis purposes. For alternatives C and D, it is assumed that at most one activity occurs in a given year.

Table J-60. Summary of Output – Alternative A
Total Annual Emissions from Livestock Grazing Projects – Year 2001

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.05	0.05	1.07	0.02	0.36	0.09	0.01
Sub-total: Heavy Equipment	**0.92**	**0.18**	**1.07**	**0.02**	**0.36**	**0.09**	**0.01**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.36**	**0.41**	**1.12**	**0.03**	**0.52**	**0.12**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-61. Summary of Output – Alternative A
Total Annual Emissions from Livestock Grazing Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.53	0.00	0.13	0.04	0.00
Sub-total: Heavy Equipment	**0.88**	**0.15**	**0.53**	**0.00**	**0.13**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.32**	**0.37**	**0.58**	**0.01**	**0.29**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-62. Summary of Output – Alternative A
Total Annual Emissions from Livestock Grazing Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.04	0.00	0.01	0.02	0.00
Sub-total: Heavy Equipment	**0.87**	**0.13**	**0.04**	**0.00**	**0.01**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.31**	**0.36**	**0.09**	**0.01**	**0.17**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-63. Summary of Output – Alternative B
Total Annual Emissions from Livestock Grazing Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.53	0.00	0.13	0.04	0.00
Sub-total: Heavy Equipment	**0.88**	**0.15**	**0.53**	**0.00**	**0.13**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.32**	**0.37**	**0.58**	**0.01**	**0.29**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-64. Summary of Output – Alternative B
Total Annual Emissions from Livestock Grazing Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.04	0.00	0.01	0.02	0.00
Sub-total: Heavy Equipment	**0.87**	**0.13**	**0.04**	**0.00**	**0.01**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.31**	**0.36**	**0.09**	**0.01**	**0.17**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-65. Summary of Output – Alternative C
Total Annual Emissions from Livestock Grazing Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.53	0.00	0.13	0.04	0.00
Sub-total: Heavy Equipment	**0.88**	**0.15**	**0.53**	**0.00**	**0.13**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.32**	**0.37**	**0.58**	**0.01**	**0.29**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-66. Summary of Output – Alternative C
Total Annual Emissions from Livestock Grazing Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.04	0.00	0.01	0.02	0.00
Sub-total: Heavy Equipment	**0.87**	**0.13**	**0.04**	**0.00**	**0.01**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.31**	**0.36**	**0.09**	**0.01**	**0.17**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-67. Summary of Output – Alternative D (Preferred Alternative)
Total Annual Emissions from Livestock Grazing Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Heavy Equipment - Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.53	0.00	0.13	0.04	0.00
Sub-total: Heavy Equipment	**0.88**	**0.15**	**0.53**	**0.00**	**0.13**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.32**	**0.37**	**0.58**	**0.01**	**0.29**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-68. Summary of Output – Alternative D (Preferred Alternative) Total Annual Emissions from Livestock Grazing Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.87	0.13	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.04	0.00	0.01	0.02	0.00
Sub-total: Heavy Equipment	**0.87**	**0.13**	**0.04**	**0.00**	**0.01**	**0.02**	**0.00**
Commuting Vehicles - Fugitive Dust	1.43	0.21	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.05	0.01	0.16	0.03	0.00
Sub-total: Commuting Vehicles	**1.44**	**0.22**	**0.05**	**0.01**	**0.16**	**0.03**	**0.00**
Total	**2.31**	**0.36**	**0.09**	**0.01**	**0.17**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-69. Summary of Output – Alternative A Total Annual Emissions from Vegetation Projects – Year 2001

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-70. Summary of Output – Alternative A
Total Annual Emissions from Vegetation Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-71. Summary of Output – Alternative A
Total Annual Emissions from Vegetation Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-72. Summary of Output – Alternative B
Total Annual Emissions from Vegetation Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-73. Summary of Output – Alternative B
Total Annual Emissions from Vegetation Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-74. Summary of Output – Alternative C
Total Annual Emissions from Vegetation Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-75. Summary of Output – Alternative C
Total Annual Emissions from Vegetation Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-76. Summary of Output – Alternative D (Preferred Alternative)
Total Annual Emissions from Vegetation Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-77. Summary of Output – Alternative D (Preferred Alternative)
Total Annual Emissions from Vegetation Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	1.04	0.16	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub-total: Heavy Equipment	**1.04**	**0.16**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Commuting Vehicles - Fugitive Dust	0.83	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.05	0.00	0.00
Sub-total: Commuting Vehicles	**0.83**	**0.13**	**0.01**	**0.00**	**0.05**	**0.00**	**0.00**
Total	**1.87**	**0.28**	**0.01**	**0.00**	**0.05**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-78. Summary of Output – Alternative A
Total Annual Emissions from Fire Management Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.21	0.00	0.88	0.30	0.03
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.21**	**0.00**	**0.88**	**0.30**	**0.03**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.30**	**0.27**	**0.01**	**1.16**	**0.46**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-79. Summary of Output – Alternative A
Total Annual Emissions from Fire Management Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.02	0.00	0.68	0.12	0.01
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.02**	**0.00**	**0.68**	**0.12**	**0.01**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.29**	**0.07**	**0.01**	**0.96**	**0.29**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-80. Summary of Output – Alternative B
Total Annual Emissions from Fire Management Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.21	0.00	0.88	0.30	0.03
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.21**	**0.00**	**0.88**	**0.30**	**0.03**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.30**	**0.27**	**0.01**	**1.16**	**0.46**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-81. Summary of Output – Alternative B
Total Annual Emissions from Fire Management Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.02	0.00	0.68	0.12	0.01
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.02**	**0.00**	**0.68**	**0.12**	**0.01**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.29**	**0.07**	**0.01**	**0.96**	**0.29**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-82. Summary of Output – Alternative C
Total Annual Emissions from Fire Management Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.11	0.00	0.86	0.29	0.03
Sub-total: Heavy Equipment	**0.02**	**0.02**	**0.11**	**0.00**	**0.86**	**0.29**	**0.03**
Commuting Vehicles - Fugitive Dust	0.49	0.07	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.04	0.01	0.24	0.16	0.02
Sub-total: Commuting Vehicles	**0.50**	**0.09**	**0.04**	**0.01**	**0.24**	**0.16**	**0.02**
Total	**0.53**	**0.11**	**0.15**	**0.01**	**1.10**	**0.45**	**0.04**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-83. Summary of Output – Alternative C
Total Annual Emissions from Fire Management Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	0.00	0.00	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.01	0.00	0.68	0.12	0.01
Sub-total: Heavy Equipment	**0.02**	**0.02**	**0.01**	**0.00**	**0.68**	**0.12**	**0.01**
Commuting Vehicles - Fugitive Dust	0.49	0.07	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.01	0.01	0.04	0.01	0.24	0.16	0.02
Sub-total: Commuting Vehicles	**0.50**	**0.09**	**0.04**	**0.01**	**0.24**	**0.16**	**0.02**
Total	**0.52**	**0.11**	**0.05**	**0.01**	**0.92**	**0.27**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-84. Summary of Output – Alternative D (Preferred Alternative) Total Annual Emissions from Fire Management Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Heavy Equipment - Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.21	0.00	0.88	0.30	0.03
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.21**	**0.00**	**0.88**	**0.30**	**0.03**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.30**	**0.27**	**0.01**	**1.16**	**0.46**	**0.05**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-85. Summary of Output – Alternative D (Preferred Alternative) Total Annual Emissions from Fire Management Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	**$PM_{2.5}$**	**NO_x**	**SO_2**	**CO**	**VOC**	**HAPs[b]**
Fugitive Dust	67.60	10.14	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.02	0.02	0.02	0.00	0.68	0.12	0.01
Sub-total: Heavy Equipment	**67.62**	**10.16**	**0.02**	**0.00**	**0.68**	**0.12**	**0.01**
Commuting Vehicles - Fugitive Dust	0.79	0.12	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.02	0.02	0.06	0.01	0.29	0.17	0.02
Sub-total: Commuting Vehicles	**0.81**	**0.14**	**0.06**	**0.01**	**0.29**	**0.17**	**0.02**
Total	**68.43**	**10.29**	**0.07**	**0.01**	**0.96**	**0.29**	**0.03**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-86. Summary of Output – Alternative A
Total Annual Emissions from Forest and Woodlands Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	6.50	0.98	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.23	0.08	0.01
Sub-total: Heavy Equipment	**6.51**	**0.98**	**0.00**	**0.00**	**0.23**	**0.08**	**0.01**
Commuting Vehicles - Fugitive Dust	0.59	0.09	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.04	0.01	0.00
Sub-total: Commuting Vehicles	**0.59**	**0.09**	**0.01**	**0.00**	**0.04**	**0.01**	**0.00**
Total	**7.10**	**1.07**	**0.01**	**0.00**	**0.27**	**0.09**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-87. Summary of Output – Alternative A
Total Annual Emissions from Forest and Woodlands Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	6.50	0.98	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.19	0.03	0.00
Sub-total: Heavy Equipment	**6.51**	**0.98**	**0.00**	**0.00**	**0.19**	**0.03**	**0.00**
Commuting Vehicles - Fugitive Dust	0.59	0.09	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.04	0.01	0.00
Sub-total: Commuting Vehicles	**0.59**	**0.09**	**0.01**	**0.00**	**0.04**	**0.01**	**0.00**
Total	**7.10**	**1.07**	**0.01**	**0.00**	**0.23**	**0.04**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-88. Summary of Output – Alternative B
Total Annual Emissions from Forest and Woodlands Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	5.20	0.78	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.19	0.06	0.01
Sub-total: Heavy Equipment	**5.20**	**0.78**	**0.00**	**0.00**	**0.19**	**0.06**	**0.01**
Commuting Vehicles - Fugitive Dust	0.47	0.07	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.03	0.01	0.00
Sub-total: Commuting Vehicles	**0.47**	**0.07**	**0.01**	**0.00**	**0.03**	**0.01**	**0.00**
Total	**5.68**	**0.86**	**0.01**	**0.00**	**0.22**	**0.07**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-89. Summary of Output – Alternative B
Total Annual Emissions from Forest and Woodlands Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	5.20	0.78	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.00	0.00	0.00	0.00	0.15	0.03	0.00
Sub-total: Heavy Equipment	**5.20**	**0.78**	**0.00**	**0.00**	**0.15**	**0.03**	**0.00**
Commuting Vehicles - Fugitive Dust	0.47	0.07	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.01	0.00	0.03	0.01	0.00
Sub-total: Commuting Vehicles	**0.47**	**0.07**	**0.01**	**0.00**	**0.03**	**0.01**	**0.00**
Total	**5.68**	**0.86**	**0.01**	**0.00**	**0.18**	**0.03**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-90. Summary of Output – Alternative C
Total Annual Emissions from Forest and Woodlands Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	7.80	1.17	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.28	0.10	0.01
Sub-total: Heavy Equipment	**7.81**	**1.18**	**0.00**	**0.00**	**0.28**	**0.10**	**0.01**
Commuting Vehicles - Fugitive Dust	0.71	0.11	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.02	0.00	0.05	0.01	0.00
Sub-total: Commuting Vehicles	**0.71**	**0.11**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**
Total	**8.51**	**1.28**	**0.02**	**0.00**	**0.33**	**0.10**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-91. Summary of Output – Alternative C
Total Annual Emissions from Forest and Woodlands Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	7.80	1.17	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.22	0.04	0.00
Sub-total: Heavy Equipment	**7.81**	**1.18**	**0.00**	**0.00**	**0.22**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	0.71	0.11	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.02	0.00	0.05	0.01	0.00
Sub-total: Commuting Vehicles	**0.71**	**0.11**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**
Total	**8.51**	**1.28**	**0.02**	**0.00**	**0.27**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-92. Summary of Output – Alternative D (Preferred Alternative) Total Annual Emissions from Forest and Woodlands Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	7.80	1.17	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.28	0.10	0.01
Sub-total: Heavy Equipment	**7.81**	**1.18**	**0.00**	**0.00**	**0.28**	**0.10**	**0.01**
Commuting Vehicles - Fugitive Dust	0.71	0.11	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.02	0.00	0.05	0.01	0.00
Sub-total: Commuting Vehicles	**0.71**	**0.11**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**
Total	**8.51**	**1.28**	**0.02**	**0.00**	**0.33**	**0.10**	**0.01**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-93. Summary of Output – Alternative D (Preferred Alternative) Total Annual Emissions from Forest and Woodlands Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	7.80	1.17	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	0.01	0.01	0.00	0.00	0.22	0.04	0.00
Sub-total: Heavy Equipment	**7.81**	**1.18**	**0.00**	**0.00**	**0.22**	**0.04**	**0.00**
Commuting Vehicles - Fugitive Dust	0.71	0.11	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	0.00	0.00	0.02	0.00	0.05	0.01	0.00
Sub-total: Commuting Vehicles	**0.71**	**0.11**	**0.02**	**0.00**	**0.05**	**0.01**	**0.00**
Total	**8.51**	**1.28**	**0.02**	**0.00**	**0.27**	**0.05**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-94. Summary of Output – Alternative A
Summary of ROWs and Corridors Emissions – Year 2001

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	49.25	49.25	883.78	19.56	307.65	79.49	7.95
Sub-total: Heavy Equipment	**52.10**	**49.68**	**883.78**	**19.56**	**307.65**	**79.49**	**7.95**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**72.73**	**54.36**	**892.53**	**21.29**	**328.28**	**84.72**	**8.47**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-95. Summary of Output – Alternative A
Summary of ROWs and Corridors Emissions – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	17.60	17.60	468.75	2.17	119.80	28.05	2.80
Sub-total: Heavy Equipment	**20.46**	**18.03**	**468.75**	**2.17**	**119.80**	**28.05**	**2.80**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**41.08**	**22.72**	**477.50**	**3.91**	**140.42**	**33.28**	**3.33**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-96. Summary of Output – Alternative A
Summary of ROWs and Corridors Emissions – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	1.20	1.20	61.70	2.17	11.88	14.13	1.41
Sub-total: Heavy Equipment	**4.05**	**1.63**	**61.70**	**2.17**	**11.88**	**14.13**	**1.41**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**24.68**	**6.31**	**70.45**	**3.91**	**32.51**	**19.36**	**1.94**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-97. Summary of Output – Alternative B
Summary of ROWs and Corridors Emissions – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	2.81	0.42	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	17.60	17.60	468.75	2.17	119.79	28.05	2.80
Sub-total: Heavy Equipment	**20.42**	**18.03**	**468.75**	**2.17**	**119.79**	**28.05**	**2.80**
Commuting Vehicles - Fugitive Dust	18.49	2.76	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.07	1.90	8.72	1.73	20.55	5.21	0.52
Sub-total: Commuting Vehicles	**20.56**	**4.67**	**8.72**	**1.73**	**20.55**	**5.21**	**0.52**
Total	**40.98**	**22.69**	**477.47**	**3.90**	**140.35**	**33.26**	**3.33**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-98. Summary of Output – Alternative B
Summary of ROWs and Corridors Emissions – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.81	0.42	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	1.20	1.20	61.70	2.17	11.88	14.13	1.41
Sub-total: Heavy Equipment	**4.02**	**1.62**	**61.70**	**2.17**	**11.88**	**14.13**	**1.41**
Commuting Vehicles - Fugitive Dust	18.49	2.76	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.07	1.90	8.72	1.73	20.55	5.21	0.52
Sub-total: Commuting Vehicles	**20.56**	**4.67**	**8.72**	**1.73**	**20.55**	**5.21**	**0.52**
Total	**24.58**	**6.29**	**70.41**	**3.90**	**32.44**	**19.34**	**1.93**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-99. Summary of Output – Alternative C
Summary of ROWs and Corridors Emissions – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	17.60	17.60	468.75	2.17	119.80	28.05	2.80
Sub-total: Heavy Equipment	**20.46**	**18.03**	**468.75**	**2.17**	**119.80**	**28.05**	**2.80**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**41.08**	**22.72**	**477.50**	**3.91**	**140.42**	**33.28**	**3.33**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-100. Summary of Output – Alternative C
Summary of ROWs and Corridors Emissions – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	1.20	1.20	61.70	2.17	11.88	14.13	1.41
Sub-total: Heavy Equipment	**4.05**	**1.63**	**61.70**	**2.17**	**11.88**	**14.13**	**1.41**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**24.68**	**6.31**	**70.45**	**3.91**	**32.51**	**19.36**	**1.94**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-101. Summary of Output – Alternative D (Preferred Alternative)
Summary of ROWs and Corridors Emissions – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Heavy Equipment - Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	17.60	17.60	468.75	2.17	119.80	28.05	2.80
Sub-total: Heavy Equipment	**20.46**	**18.03**	**468.75**	**2.17**	**119.80**	**28.05**	**2.80**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**41.08**	**22.72**	**477.50**	**3.91**	**140.42**	**33.28**	**3.33**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-102. Summary of Output – Alternative D (Preferred Alternative) Summary of ROWs and Corridors Emissions – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Fugitive Dust	2.85	0.43	---	---	---	---	---
Heavy Equipment - Vehicle Exhaust[a]	1.20	1.20	61.70	2.17	11.88	14.13	1.41
Sub-total: Heavy Equipment	**4.05**	**1.63**	**61.70**	**2.17**	**11.88**	**14.13**	**1.41**
Commuting Vehicles - Fugitive Dust	18.55	2.77	---	---	---	---	---
Commuting Vehicles - Vehicle Exhaust	2.08	1.91	8.75	1.73	20.62	5.23	0.52
Sub-total: Commuting Vehicles	**20.63**	**4.68**	**8.75**	**1.73**	**20.62**	**5.23**	**0.52**
Total	**24.68**	**6.31**	**70.45**	**3.91**	**32.51**	**19.36**	**1.94**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-103. All Alternatives Total of All OHV Emissions

Year	Emissions (Tons/Year)				
	Hydro-carbons (HC)	Carbon Monoxide (CO)	Nitrogen Oxides (NO_x)	Particulate Matter (PM)	HAPs[a]
2000	233.50	433.98	2.99	7.11	23.35
2005	354.14	971.04	4.54	11.35	35.41
2010	456.85	1,220.07	6.39	14.99	45.69
2020	551.81	1,505.53	8.48	18.04	55.18

[a] Hazardous air pollutants; assumed equal to HC * 0.10.

Table J-104. Summary of Output – Alternative A
Total Annual Emissions from Road Maintenance Projects – Year 2001

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.02	0.02	0.45	0.01	0.14	0.04	0.00
Total	**3.80**	**0.43**	**0.45**	**0.01**	**0.14**	**0.04**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-105. Summary of Output – Alternative A
Total Annual Emissions from Road Maintenance Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.01	0.01	0.22	0.00	0.05	0.02	0.00
Total	**3.79**	**0.41**	**0.22**	**0.00**	**0.05**	**0.02**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-106. Summary of Output – Alternative A
Total Annual Emissions from Road Maintenance Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Total	**3.78**	**0.41**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-107. Summary of Output – Alternative B
Total Annual Emissions from Road Maintenance Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.01	0.01	0.22	0.00	0.05	0.02	0.00
Total	**3.79**	**0.41**	**0.22**	**0.00**	**0.05**	**0.02**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-108. Summary of Output – Alternative B
Total Annual Emissions from Road Maintenance Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Total	**3.78**	**0.41**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-109. Summary of Output – Alternative C
Total Annual Emissions from Road Maintenance Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.01	0.01	0.22	0.00	0.05	0.02	0.00
Total	**3.79**	**0.41**	**0.22**	**0.00**	**0.05**	**0.02**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.

[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-110. Summary of Output – Alternative C
Total Annual Emissions from Road Maintenance Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Total	**3.78**	**0.41**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-111. Summary of Output – Alternative D (Preferred Alternative)
Total Annual Emissions from Road Maintenance Projects – Year 2011

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.01	0.01	0.22	0.00	0.05	0.02	0.00
Total	**3.79**	**0.41**	**0.22**	**0.00**	**0.05**	**0.02**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

Table J-112. Summary of Output – Alternative D (Preferred Alternative)
Total Annual Emissions from Road Maintenance Projects – Year 2020

Activity	Annual Emissions (Tons)						
	PM_{10}	$PM_{2.5}$	NO_x	SO_2	CO	VOC	HAPs[b]
Road Maintenance - Fugitive Dust	3.78	0.41	---	---	---	---	---
Road Maintenance - Combustive Emissions[a]	0.00	0.00	0.01	0.00	0.00	0.01	0.00
Total	**3.78**	**0.41**	**0.01**	**0.00**	**0.00**	**0.01**	**0.00**

[a] $PM_{2.5}$ assumed = PM_{10} for this source.
[b] HAPs = Hazardous Air Pollutants; assumed = VOCs * 0.1

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KEMMERER DRAFT
RESOURCE MANAGEMENT PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

APPENDIX K

Economic Impact Analysis Methodology

Appendix K
Economic Impact Analysis Methodology

This appendix describes the detailed data used in the economic impact modeling analysis. Input-output models such as the Impact Analysis for Planning (IMPLAN) model, an economic impact analysis model, provide a quantitative representation of the production relationships between individual economic sectors. Thus, the economic modeling analysis uses information about physical production quantities and the prices and costs for goods and services. The inputs required to run the IMPLAN model are described in the following narrative and tables. The resulting estimates from the IMPLAN model, by alternative, can be found in the Economic Conditions section in Chapter 4. The first section, below, provides details of how the IMPLAN model was used to estimate economic impacts. The remaining sections provide additional detailed data used in the analysis for oil and gas, coal, livestock grazing, and recreation.

1.0 THE IMPLAN MODEL

IMPLAN is a regional economic model that provides a mathematical accounting of the flow of money, goods, and services through a region's economy. The model provides estimates of how a specific economic activity translates into jobs and income for the region. It includes the ripple effect (also called the "multiplier effect") of changes in economic sectors that may not be directly impacted by management actions, but are linked to industries that are directly impacted. In IMPLAN, these ripple effects are termed indirect impacts (for changes in industries that sell inputs to the industries that are directly impacted) and induced impacts (for changes in household spending as household income increases or decreases due to the changes in production).

The IMPLAN model classifies economic activity into over 500 sectors. This analysis involved direct changes in economic activity across many of these economic sectors, including sectors related to oil and gas production (primarily Natural Gas and Crude Petroleum, Maintenance and Repair of Oil and Gas Wells, and Wholesale Trade, which captures purchases of tangible equipment such as pipe, casing, valves, and meters). (The distribution of expenditures across IMPLAN sectors is based on information from actual expenditures obtained from operators for wells drilled in southwest Wyoming (Taylor 2007)). In addition, the analysis involved direct changes in sectors related to livestock production (Ranch Cattle, and Sheep, Lambs, and Goats) and sectors related to off-highway vehicle (OHV) use and recreation: Hotels and Lodging Places, Eating and Drinking, Amusement and Recreation Services, Food Stores, Service Stations, and Miscellaneous Retail. Based on the relationships between and among sectors in the IMPLAN model, the direct changes in these economic sectors translate into indirect changes in all other related sectors due to the ripple effect.

The IMPLAN production coefficients were modified (calibrated) to reflect the interaction of producing sectors in the three county (Lincoln, Sweetwater, Uinta) study area. As a result, the calibrated model does a better job of generating multipliers and the subsequent impacts that reflect the interaction between and among the sectors in the study area compared to a model using unadjusted national coefficients. Specifically, worker productivity in oil and gas production is higher in Wyoming than nationally, and more of the hay used for livestock feed is produced within the region, compared with national averages. Key variables used in the IMPLAN model were filled in using data specific to Wyoming, including employment estimates, labor earnings, and total industry output (Taylor 2004). Due to price fluctuations, the value of cattle and sheep production was based on the average value from 1993 to 2002, calculated based on data from the Wyoming Agricultural Statistics Service (Taylor 2004). This analysis used IMPLAN 2000; prior to running the model, cost and price data were converted to a consistent dollar year (2000) using regional and sector-specific adjustment factors from the IMPLAN model. The values in this appendix generally are expressed in year 2004 dollars so that the earnings and employment estimates can be easily compared to the latest (i.e., 2004) earnings and employment data available from the Bureau of Economic Analysis.

2.0 OIL AND GAS

The economic impacts analysis for oil and gas reflects drilling, completion, and production activities.

The Minerals – Leasable section in Chapter 4 provides information on the number of oil and gas wells drilled and number of wells completed (i.e., productive wells). Estimated oil and gas production on Bureau of Land Management (BLM)-administered land and mineral estate from 2001 to 2020 in the planning area is shown at the end of this section (Tables K-5 and K-6). The costs of drilling and completing wells and producing oil and gas also are relevant for the economic impact analysis.

The IMPLAN model assumes that workers involved in well drilling and completion in the oil and gas fields spend a portion of their earnings within the planning area. This spending generates additional output, jobs, and earnings in the planning area due to the multiplier effect. However, some oil and gas drilling and completion workers may spend less of their wages in the planning area than is reflected by the IMPLAN model. Due to this uncertainty, the analysis of indirect and induced impacts due to oil and gas drilling and completion reflects two alternative assumptions about the portion of earnings that field workers spend within the planning area. The "high scenario" reflects the default assumption in IMPLAN about how much of their earnings field workers spend in the planning area, while the "low scenario" reflects an assumption that workers involved in oil and gas drilling and completion do not spend any of their income within the planning area.

Table K-1 provides a summary of the assumptions used for the economic analysis relative to the costs of drilling, completion, and production of conventional wells in the Moxa Arch and Overthrust Belt regions, as well as for coalbed natural gas wells.

Table K-1. Assumptions for Analysis of Economic Impacts for Oil and Gas Well Drilling and Completion According to Well Type

Assumption	Conventional Wells		Coalbed Natural Gas Wells
	Moxa Arch	Overthrust Belt	
Drilling Impacts			
Drilling Cost ($/well)	$549,916	$2,429,407	$50,918
Local Drilling Costs[1]	87%	87%	87%
Local Direct Impact ($/well)	$478,427	$2,113,584	$44,299
Local Total Impact ($/well)[2] – High Scenario[3]	$642,964	$2,840,473	$59,533
Multiplier (total impact/direct impact) – High Scenario[3]	1.34	1.34	1.34
Local Total Impact ($/well)[2] – Low Scenario[3]	$604,604	$2,671,006	$55,982
Multiplier (total impact/direct impact) – Low Scenario[3]	1.26	1.26	1.26
Completion Impacts			
Completion Cost ($/well)	$256,125	$1,059,227	$40,980
Local Completion Costs[1]	41%	41%	41%
Local Direct Impact ($/well)	$105,011	$434,283	$16,802
Local Total Impact ($/well)[2] – High Scenario[3]	$137,837	$570,036	$22,054
Multiplier (total impact/direct impact) – High Scenario[3]	1.31	1.31	1.31
Local Total Impact ($/well)[2] – Low Scenario[3]	$132,959	$549,865	$21,273
Multiplier (total impact/direct impact) – Low Scenario[3]	1.27	1.27	1.27

Source: Drilling and completion costs are from BLM 2006a, adjusted from 2003 to 2004 dollars using IMPLAN adjustment factors. Moxa Arch well costs correspond to 9,000-10,000 foot Frontier wells, and Overthrust Belt well costs correspond to a weighted average of 12,000-foot Frontier wells (70%) and 15,000 to 16,000-foot Dakota/Frontier wells (30%). Local drilling and completion costs are calculated using data provided by Taylor (2004).

[1] The local cost shares were based on the percent of total drilling or completion costs that would be spent on goods and services purchased from the local economy.

[2] Total impacts estimated using IMPLAN include direct, indirect, and induced impacts.

[3] As described in the text, the high scenario reflects the default assumption in IMPLAN about how much of their earnings field workers spend in the planning area, while the low scenario reflects an assumption that workers involved in oil and gas drilling and completion do not spend any of their income within the planning area.

The assumptions in Table K-2 were used to determine the values of natural gas and oil production. In addition, the analysis used a figure of $0.89 (year 2000 dollars) per thousand cubic feet (mcf) for gas production costs based on data from the Energy Information Administration (Taylor 2004).

Table K-2. Assumptions for Analysis of Economical Impacts on Output for Oil and Gas Production

Economic Impact	Oil Production (per million barrels)	Gas Production (per billion cubic feet)
Direct Economic Impact[1]	$39,369,760[2]	$5,901,380[3]
Indirect Economic Impact[4]	$3,868,866	$579,929
Induced Economic Impact[5]	$426,060	$63,865
Total Economic Impact	$43,664,686	$6,545,173
Multiplier (total impact/direct impact)	1.11	1.11

Note: All dollar values are in 2004 dollars. Production cost is calculated based on data from the Energy Information Administration, as documented in Taylor (2004).

[1] Direct economic impact is the market value of output.

[2] Based on oil price forecast of $40 per barrel for beyond 2006 (CREG 2006), adjusted to 2004 dollars using IMPLAN adjustment factors.

[3] Based on natural gas price forecast of $6.00 per thousand cubic feet for beyond 2006 (CREG 2006), adjusted to 2004 dollars using IMPLAN adjustment factors.

[4] Indirect impacts from IMPLAN reflect increased demand in sectors that directly or indirectly provide supplies to the oil and gas industry.

[5] Induced impacts from IMPLAN reflect increased demand in the consumer and government sectors.

The forecasted number of wells and production used for estimating employment impacts is the same as for estimating impacts on labor earnings and output. Table K-3 shows the direct and total employment impacts attributable to drilling and completion. Table K-3 also two alternative assumptions about where oil and gas drilling and completion workers spend their earnings: the high scenario reflects the default assumption in IMPLAN about how much of their earnings field workers spend in the planning area, while the low scenario reflects an assumption that workers involved in oil and gas drilling and completion do not spend any of their income within the planning area.

Table K-3. Assumptions for Employment Impact Analysis for Oil and Gas Well Drilling and Completion According to Well Type

Employment Impact	Conventional Wells		Coalbed Natural Gas Wells
	Moxa Arch	Overthrust Belt	
Drilling Impacts			
Direct Employment (jobs/well)	3.3	14.7	0.3
Total Employment Impact (jobs/well) – High Scenario[1]	5.3	23.2	0.5
Multiplier (Total Impact/Direct Impact) – High Scenario[1]	1.59	1.59	1.59
Average Earnings per Job (2004 dollars) – High Scenario[1]	$36,107	$36,107	$36,107
Total Employment Impact (jobs/well) – Low Scenario[1]	4.7	20.9	0.4
Multiplier (Total Impact/Direct Impact) – Low Scenario[1]	1.43	1.43	1.43
Average Earnings per Job (2004 dollars) – Low Scenario[1]	$37,758	$37,758	$37,758
Completion Impacts			
Direct Employment (jobs/well)	0.9	3.8	0.1
Total Employment Impact (jobs/well) – High Scenario[1]	1.3	5.5	0.2
Multiplier (Total Impact/Direct Impact) – High Scenario[1]	1.47	1.47	1.47
Average Earnings per Job (2004 dollars) – High Scenario[1]	$34,603	$34,603	$34,603
Total Employment Impact (jobs/well) – Low Scenario[1]	1.3	5.3	0.2
Multiplier (Total Impact/Direct Impact) – Low Scenario[1]	1.39	1.39	1.39
Average Earnings per Job (2004 dollars) – Low Scenario[1]	$35,309	$35,309	$35,309

Note: Direct and total employment impact and average earnings per job are calculated using IMPLAN.

[1] As described in the text, the high scenario reflects the default assumption in IMPLAN about how much of their earnings field workers spend in the planning area, while the low scenario reflects an assumption that workers involved in oil and gas drilling and completion do not spend any of their income within the planning area.

Table K-4 shows the direct and total employment impacts associated with production.

Table K-4. Assumptions for Employment Impacts Analysis for Oil and Gas Production

Employment Impact (annual number of jobs)	Oil Production (per million barrels)	Gas Production (per billion cubic feet)
Direct Employment	3.9	0.6
Indirect Employment	19.3	2.9
Induced Employment	7.7	1.2
Total Employment	30.8	4.6
Multiplier (Total Impact/Direct Impact)	8.0	8.0
Average Earnings per Job (2004 dollars)	$40,238	$40,238

Note: Direct, indirect, and induced employment impact and average earnings per job are calculated using IMPLAN.

The analysis of potential changes in tax revenues is based on tax rates of 12.5 percent of taxable value for federal mineral royalties, 6 percent of taxable value for state severance taxes (WY DOR 2001), and 6.3 percent of taxable value for local ad valorem production taxes (based on averaging local mineral tax rates for Lincoln, Sweetwater, and Uinta Counties from WY DOR (2006), and reported in the Economic Conditions section of Chapter 3. Taxable value refers to value of sales minus allowable deductions, including certain costs of production and transportation. For analysis purposes, taxable value was estimated based on the average taxable value per unit sold from the three counties in the planning area for

July 2005 through June 2006 using data from WY DOR (2006). Taxable value was estimated as $49.02 per barrel for oil, and $5.09 per mcf for natural gas (2004 dollars).

Table K-5 shows estimated gas production, and Table K-6 shows estimated oil production, on Bureau of Land Management (BLM)-administered land and mineral estate from 2001 to 2020 in the planning area, which was used as an input for the IMPLAN analysis of oil and gas production.

Table K-5. Estimated Federal Gas Production in the Planning Area (billions of cubic feet)

Year	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
2001	3.56	3.56	3.56	3.56
2002	4.29	4.29	4.29	4.29
2003	11.51	9.30	11.51	11.51
2004	17.68	13.13	17.78	17.61
2005	23.85	16.74	24.01	23.69
2006	29.20	19.78	29.29	28.99
2007	34.26	22.76	34.39	33.96
2008	38.99	25.42	39.17	38.61
2009	43.64	28.01	43.85	43.17
2010	47.68	30.38	47.79	47.32
2011	51.70	32.68	51.82	51.24
2012	55.15	34.52	55.34	54.64
2013	58.58	36.58	58.82	58.02
2014	61.50	38.23	61.63	60.88
2015	64.45	39.84	64.61	63.78
2016	66.93	41.28	67.01	66.25
2017	69.47	42.59	69.60	68.74
2018	71.54	43.69	71.58	70.95
2019	73.40	45.02	73.64	73.06
2020	75.19	45.90	75.38	74.79
Total	902.59	573.71	905.07	895.05

Source: BLM 2006b.

Table K-6. Estimated Federal Oil Production in the Planning Area (millions of barrels)

Year	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
2001	0.07	0.07	0.07	0.07
2002	0.07	0.07	0.07	0.07
2003	0.19	0.15	0.19	0.19
2004	0.29	0.21	0.29	0.29
2005	0.38	0.26	0.38	0.37
2006	0.44	0.30	0.44	0.44
2007	0.51	0.33	0.51	0.50
2008	0.56	0.36	0.56	0.55
2009	0.60	0.38	0.61	0.60
2010	0.64	0.41	0.64	0.63
2011	0.67	0.42	0.68	0.67
2012	0.70	0.44	0.70	0.69
2013	0.72	0.45	0.73	0.72
2014	0.74	0.46	0.74	0.73
2015	0.76	0.47	0.76	0.75
2016	0.77	0.48	0.77	0.76
2017	0.79	0.49	0.79	0.78
2018	0.79	0.49	0.80	0.79
2019	0.80	0.50	0.81	0.80
2020	0.81	0.50	0.81	0.80
Total	11.29	7.24	11.35	11.22

Source: BLM 2006b.

3.0 LIVESTOCK GRAZING

Economic impacts due to changes in livestock grazing are a function of the amount of forage available and the economic value of the forage. For livestock grazing, long-term surface-disturbing actions from actions listed in Appendix M could affect the authorized animal unit months (AUMs). In addition, land disposal actions could have economic impacts; however, those impacts were not analyzed quantitatively because it is difficult to predict the net change in AUMs. Subsequent landowners may continue to graze the land, leaving overall livestock production and output in the region unaffected.

Table K-7 provides a summary, according to alternatives, of initial AUMs and total AUMs lost by 2020 due to surface-disturbing activities. Based on current allocations of AUMs to cattle and sheep (BLM 2003), 62 percent of the AUM reduction is allocated to cattle and 38 percent to sheep, for the purpose of estimating changes in output and employment.[1] The base number of AUMs available is 157,249 (Netherly 2004). Surface-disturbance acres were converted to AUMs using a conversion factor of 9.3 acres per AUM (Netherly 2004).

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[1] In some years, actual use of grazing leases may be less than 100 percent of authorized use. If surface disturbance impacts land that is authorized for grazing, but not actually used in a given year, then no economic impacts would result from the loss of that grazing land.

Table K-7. Estimated Animal Unit Month Losses

Item	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Initial AUMs	157,249	157,249	157,249	157,249
AUMs lost from surface-disturbing activities (total)	15,556	5,128	15,534	8,338
Incremental AUMs lost from surface-disturbing activities (per year)	778	256	777	417
Net AUMs in 2020	141,693	152,121	141,715	148,911

Note: Acres are converted to AUMs using a conversion factor of 9.3 acres per AUM (Netherly 2004).

Due to price fluctuations, average per-AUM values for cattle and sheep are based on the 1993 to 2002 average value of production estimates from the Wyoming Agricultural Statistics Service (Taylor 2004). The value for cattle is $36.91 per AUM and the value for sheep is $23.97 per AUM (in 2004 dollars). Including indirect and induced impacts, the value of one AUM for cattle is $64.71 and for sheep $41.08 (in 2004 dollars). Table K-8 shows the economic impact assumptions for cattle and sheep. The direct economic impact is the estimated change in livestock output per AUM; IMPLAN generates the indirect and induced impacts.

Table K-8. Assumptions for Analysis of Impacts on Output for Livestock Grazing

Economic Impact	Cattle	Sheep
Direct Economic Impact ($/AUM)[1]	$36.91	$23.97
Indirect Economic Impact ($/AUM)[2]	$20.99	$12.74
Induced Economic Impact ($/AUM)[3]	$6.81	$4.37
Total Economic Impact ($/AUM)	$64.71	$41.08
Multiplier (Total Impact/Direct Impact)	1.75	1.71

Note: All dollar values are in 2004 dollars.

[1] Direct economic impact is the market value of output, based on data for 1993-2002 from Wyoming Agricultural Statistics Service (Taylor 2004).

[2] Indirect impacts reflect increased demand in sectors that directly or indirectly provide supplies to the livestock industry.

[3] Induced impacts reflect increased demand in the consumer and government sectors.

AUM Animal Unit Month

Table K-9 provides a summary of the employment impacts assumed according to unit changes in livestock AUMs.

Table K-9. Assumptions for Analysis of Employment Impacts for Livestock Grazing

Employment Impact	Cattle	Sheep
Direct Employment (Jobs/1,000 AUMs)	0.307	0.700
Indirect Employment (Jobs/1,000 AUMs)	0.335	0.252
Induced Employment (Jobs/1,000 AUMs)	0.106	0.069
Total Employment (Jobs/1,000 AUMs)	0.747	1.021
Multiplier (Total Impact/Direct Impact)	2.44	1.46
Average Earnings per Job (2004 dollars)	$26,626	$12,341

Note: Direct, indirect, and induced employment impacts and average earnings per job are calculated using IMPLAN.

4.0 RECREATION

The analysis of economic impacts considers only recreation expenditures of nonresidents of the three-county study area. This is based on the assumption that expenditures of residents would occur in the region regardless of the BLM's actions that impact recreational opportunities; however, changes in nonresident recreation patterns would alter the amount of money entering the local region.

Economic impacts from recreation are a function of recreation visitor days (RVDs) and expenditures per day. Future RVDs were estimated based on current RVDs and estimated growth rates, both of which were provided by BLM (Mierzejewski 2006). These estimates of current and future RVDs were based on multiple sources, including a U.S. Forest Service (USFS) study that provides forecasts of recreation activity for the Rocky Mountain region (Bowker et al. 1999), contacts with neighboring BLM field offices, and the professional judgment of BLM staff (Mierzejewski 2006). Nonresident RVDs in 2003 on BLM land were estimated at 5,145 for OHV; 26,478 for hunting; 18,377 for fishing; and 7,130 for other nonconsumptive recreation (including heritage tourism, hiking, viewing wildlife, biking and horseback riding) (Mierzejewski 2006). Table K-10 provides a summary of estimated annual growth rates by alternative.

Table K-10. Estimated Annual Growth Rates for Nonresident Recreation Visitor Days

Recreation Activity	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
OHV	1.54%	1.20%	1.50%	2.00%
Hunting	1.10%	1.10%	1.10%	1.10%
Fishing	1.28%	1.28%	1.28%	1.28%
Other Nonconsumptive	1.30%	1.30%	1.30%	1.30%

Source: Mierzejewski 2006

OHV	Off-highway vehicle

The estimates for average expenditure per visitor day are $94.03 for fishing in 2002 dollars (WGFD 2003); $179.63 for hunting in 2002 dollars (Burkett 2004); $51.55 for wildlife watching in 2001 dollars (USFWS 2003; expenditures excluding equipment costs); and $130.60 for OHV use in 2000 dollars (Colorado OHV Coalition 2001). Table K-11 shows the direct, indirect, and induced output per RVD for each recreation activity, adjusted to 2004 dollars using adjustment factors from IMPLAN.

Table K-11. Assumptions for Analysis of Impacts on Output for Recreation Activities

Economic Impact	OHV (per RVD)	Hunting (per RVD)	Fishing (per RVD)	Other (per RVD)
Direct Economic Impact[1]	$143.79	$188.03	$98.28	$55.04
Indirect Economic Impact[2]	$22.76	$27.64	$10.89	$6.41
Induced Economic Impact[3]	$15.16	$25.11	$10.64	$5.36
Total Economic Impact	$181.70	$240.78	$119.81	$66.81
Multiplier (total impact/direct impact)	1.26	1.28	1.22	1.21

Note: Detail may not add to total due to rounding. All dollar values are in 2004 dollars.

[1] Direct economic impact is the average expenditure per visitor day.

[2] Indirect impacts from IMPLAN reflect increased demand in sectors that directly or indirectly provide support for the recreation industry.

[3] Induced impacts from IMPLAN reflect increased demand in the consumer and government sectors.

IMPLAN	Impact Analysis for Planning
OHV	Off-highway vehicle
RVD	Recreation visitor day

Table K-12 provides a summary of employment impacts assumed according to unit changes in RVDs.

Table K-12. Assumptions for Employment Impacts Analysis for Recreation Activities

Employment Impact (annual number of jobs)	OHV (per 1,000 RVDs)	Hunting (per 1,000 RVDS)	Fishing (per 1,000 RVDS)	Other (per 1,000 RVDS)
Direct Employment	2.5	5.2	1.7	0.8
Indirect Employment	0.3	0.4	0.1	0.1
Induced Employment	0.2	0.4	0.2	0.1
Total Employment	3.1	5.9	2.0	1.0
Multiplier (Total Impact/Direct Impact)	1.22	1.14	1.17	1.21
Average Earnings per Job (2004 dollars)	$15,152	$12,950	$16,100	$16,125

Note: Direct, indirect, and induced employment impact and average earnings per job are calculated using IMPLAN.

IMPLAN	Impact Analysis for Planning
OHV	Off-highway vehicle
RVD	Recreation visitor day

5.0 REFERENCES

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APPENDIX L

Air Quality Mitigation Matrix

Appendix L
Air Quality Mitigation Matrix

The following table outlines options for air quality mitigation in the planning area.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Nitrogen Oxide (NO_X) and Carbon Monoxide (CO) Mitigation Measures				
Utilize selective catalytic reduction (SCR) on drill rig engines and compressors.	Relatively expensive as compared to nonselective catalysts. Typical costs are $125/hp (EPA Cost Control Manual, January 2002) for compressors.	Requires the use and storage of ammonia, which presents health and safety issues. Results in increased ammonia emissions, which may contribute to the formation of ammonium sulfates and increased visibility degradation.	NO_X emission rate for compressors reduced to 0.1 g/hp-hr; reduced ammonium nitrate formation and resulting visibility impacts. Application to drill rig engines may result in substantial NO_x reduction.	Not applicable for 2-stroke engines.
Application of nonselective catalytic reduction on drill rig engines and compressors	$5,000 to $25,000 per unit	Regeneration/disposal costs for catalysts.	As a result of the BACT process, average NO_X emission rates for Wyoming compressor engines 100 hp or greater is 1.0 g/hp-hr; the application of nonselective catalysts may reduce the NO_X emission rate to 0.7 g/hp-hr for some types of engines. Application to drill rig engines may result in substantial NO_x reduction (although less reduction than with SCR).	Not applicable for lean-burn or 2-stroke engines.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Nitrogen Oxide (NO_X) and Carbon Monoxide (CO) Mitigation Measures (Continued)				
Utilize compressors driven by electrical motors.	Capital costs equal 40% of gas turbine costs; operating cost dependent on the location of high voltage powerlines.	Displaced air emissions from compressor units to electric generating stations (EGS).	May displace air emissions away from sensitive Class I areas; moderate emission reduction near compressor station. Also, typically emissions at an EGS are more heavily controlled than at individual compressor stations, so the displaced emissions are also lower than if emitted by a compressor station.	Requires high voltage power lines.
Increased diameter of sales pipelines	With larger diameter of sales pipelines, capital costs increase while operating costs decrease.	Slightly more surface disturbance.	Lower pipeline pressures, resulting in lower compression hp requirements.	None
Centralization of dehydrator units	Variable		Minor reduction in emissions.	Requires infrastructure to be feasible.
Reduce number of vehicle miles driven and unnecessary idling.	Minor		Minor to moderate emissions reduction.	
Utilize wind-generated electricity to power compressors.	Capital costs are very large.	Visual impacts from generation equipment; increased mortality of birds, including raptors.	Reduced use of fossil fuels and associated emissions.	Location of wind-generation facilities is critical; requires consistent strong winds for economic operation and high voltage transmission lines between generation facility and compressor stations.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Nitrogen Oxide (NO_X) and Carbon Monoxide (CO) Mitigation Measures (Continued)				
Increased emissions monitoring	Minor to moderate	None	Allows better planning of when, and especially where to allow future emissions to occur and when/where to provide for additional emissions mitigation. The Wyoming DEQ AQD currently has an emission tracking agreement with the BLM. The *Amended Letter of Agreement for Tracking Nitrogen Oxide Emissions* dated April 2000 calls for annual reports tracking changes in NO_X emission beginning January 1, 1996.	The monitoring of emission sources provides improved information for estimating impacts, but does not necessarily reduce the magnitude of the impacts.
Increased ambient pollutant monitoring	Moderate	None	Will measure impacts from pollutant sources of concern if correctly located.	
Reduced rate of development	Short-term loss of state and federal royalties.	Emissions generated at a lower rate for a longer period.	Peak emissions and associated impacts reduced.	Economic limitations - A minimum production rate is required to cost-effectively develop the resource while maintaining the processing and transportation infrastructure.

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Particulate Matter (PM) Mitigation Measures				
Increase water application rate to achieve greater than 50% fugitive dust control.	Varies with the source of the water and the trucking distance.	None	Can achieve fugitive dust control rates up to 95%	Diminishing returns per gallon of water applied; water must be applied at much greater rates to achieve control efficiencies greater than 75%
Unpaved road dust suppressant treatments	$2,400 to $50,000 per mile	Treatment chemicals have the potential to negatively impact water quality.	Estimated 20% to 100% reduction in fugitive dust emissions.	None
Administrative control of speed limits	Relatively low costs for installing signs and enforcement.	None	Slower speeds may provide 20% to 50% reduction in dust emissions.	State or county may retain authority for determining speed limits on primary roads.
Installation of remote telemetry	Approximately $13,000 per well	None	Reduction in vehicle miles traveled and associated vehicle emissions during production operations; no benefit for construction operations, which generate the greatest amount of PM.	Effective only for the production phase of the operations; would have no impact on construction activities that generate the greatest amount of PM.
Gravel roads	Approximately $9,000 per mile	None	Estimated 30% reduction in fugitive road dust (NOTE: use of additional low-impact road design specifications [e.g., 95% base compaction prior to placement of gravel; use of non-chlorine based dust abatement chemicals] can provide greater reduction).	None
Paved roads	Approximately $11,000 to $60,000 per mile	None	Estimated 90% reduction in fugitive road dust.	None

Table L-1. Potential Mitigation Measures for Air Quality Impacts Associated with the Proposed Kemmerer Resource Management Plan Revision (Continued)

Type of Mitigation	Estimated Cost of Mitigation	Environmental Liabilities	Environmental Benefit	Potential Limitations
Volatile Organic Compounds (VOCs) and Hazardous Air Pollutants (HAPs) Mitigation Measures				
Flareless ("green") completion	Substantial cost for equipment and infrastructure (condensate pipeline), with the payoff in about one year at $3/Mcf.		Minor reduction in emissions; substantial reduction in noise and night-time disturbance.	Requires infrastructure to be feasible.
Condensate tank vents, carbon canisters or other VOC capture to the vent discharge	Minor costs		Minor emission reduction	

AQD	Air Quality Division
BACT	best available control technology
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
g	gram
HAP	hazardous air pollutants
hp	horsepower
hr.	hour
NO_x	nitrogen oxides
PM	particulate matter
VOC	volatile organic compound

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APPENDIX M

Surface Disturbance and Reasonable Foreseeable Actions

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Fire and Fuels Management				
Management Ignited Prescribed Fire				
Acres Short-Term Disturbance from BLM Actions	40,000	40,000	0	40,000
Acres Reclaimed from BLM Actions	39,600	39,600	0	39,600
Acres Long-Term Disturbance from BLM Actions	400	400	0	400
Acres Short-Term Disturbance from Non-BLM Actions	1,500	1,500	1,500	1,500
Acres Reclaimed from Non-BLM Actions	1,350	1,350	1,350	1,350
Acres Long-Term Disturbance from Non-BLM Actions	150	150	150	150
Fuels Management - Mechanical Treatments (Hand Work)				
Acres Short-Term Disturbance from BLM Actions	2,000	2,000	0	2,000
Acres Reclaimed from BLM Actions	2,000	2,000	0	2,000
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	1,000	1,000	1,000	1,000
Acres Reclaimed from Non-BLM Actions	1,000	1,000	1,000	1,000
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Forest and Woodlands				
Silviculture Treatments, Forest Products, and Insect Control				
Acres Short-Term Disturbance from BLM Actions	2,500	2,000	3,000	3,000
Acres Reclaimed from BLM Actions	2,500	2,000	3,000	3,000
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	8,000	8,000	8,000	8,000
Acres Reclaimed from Non-BLM Actions	8,000	8,000	8,000	8,000
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions (Continued)

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Livestock Grazing				
Spring Development				
Acres Short-Term Disturbance from BLM Actions	125	125	125	125
Acres Reclaimed from BLM Actions	125	125	125	125
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	75	75	75	75
Acres Reclaimed from Non-BLM Actions	75	75	75	75
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Pipeline Development				
Acres Short-Term Disturbance from BLM Actions	150	150	150	150
Acres Reclaimed from BLM Actions	150	150	150	150
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	150	150	150	150
Acres Reclaimed from Non-BLM Actions	150	150	150	150
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Fence Development				
Acres Short-Term Disturbance from BLM Actions	600	600	600	600
Acres Reclaimed from BLM Actions	600	600	600	600
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	600	600	600	600
Acres Reclaimed from Non-BLM Actions	600	600	600	600
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions (Continued)

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Well Development				
Acres Short-Term Disturbance from BLM Actions	30	30	30	30
Acres Reclaimed from BLM Actions	30	30	30	30
Acres Long-Term Disturbance from BLM Actions	0	0	0	0
Acres Short-Term Disturbance from Non-BLM Actions	60	60	60	60
Acres Reclaimed from Non-BLM Actions	60	60	60	60
Acres Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Reservoir Maintenance				
Acres Short-Term Disturbance from BLM Actions	29	29	29	29
Acres Reclaimed from BLM Actions	5	5	5	5
Acres Long-Term Disturbance from BLM Actions	24	24	24	24
Acres Short-Term Disturbance from Non-BLM Actions	19	19	19	19
Acres Reclaimed from Non-BLM Actions	3	3	3	3
Acres Long-Term Disturbance from Non-BLM Actions	16	16	16	16
Mineral Resources – Locatable				
Acres Short-Term Disturbance from BLM Actions	700	370	700	370
Acres Reclaimed from BLM Actions	525	280	525	280
Acres Long-Term Disturbance from BLM Actions	175	90	175	90
Acres Short-Term Disturbance from Non-BLM Actions	100	100	100	100
Acres Reclaimed from Non-BLM Actions	75	75	75	75
Acres Long-Term Disturbance from Non-BLM Actions	25	25	25	25

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions (Continued)

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Mineral Resources – Coal				
Acres Short-Term Disturbance from BLM Actions	500	500	800	800
Acres Reclaimed from BLM Actions	250	250	400	400
Acres Long-Term Disturbance from BLM Actions	250	250	400	400
Acres Short-Term Disturbance from Non-BLM Actions	250	250	650	650
Acres Reclaimed from Non-BLM Actions	125	125	325	325
Acres Long-Term Disturbance from Non-BLM Actions	125	125	325	325
Mineral Resources – Oil and Gas				
Acres Short-Term Disturbance from BLM Actions	11,371	6,700	11,418	11,243
Acres Reclaimed from BLM Actions	8,352	5,212	8,355	8,221
Acres Long-Term Disturbance from BLM Actions	3,019	1,488	3,063	3,022
Acres Short-Term Disturbance from Non-BLM Actions	15,495	15,495	15,495	15,495
Acres Reclaimed from Non-BLM Actions	9,410	9,410	9,410	9,410
Acres Long-Term Disturbance from Non-BLM Actions	6,085	6,085	6,085	6,085
Mineral Resources – Other Solid Leasables				
Acres Short-Term Disturbance from BLM Actions	300	200	300	300
Acres Reclaimed from BLM Actions	225	150	225	225
Acres Long-Term Disturbance from BLM Actions	75	50	75	75
Acres Short-Term Disturbance from Non-BLM Actions	300	300	300	300
Acres Reclaimed from Non-BLM Actions	225	225	225	225
Acres Long-Term Disturbance from Non-BLM Actions	75	75	75	75

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions (Continued)

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Mineral Resources – Salables				
Acres Short-Term Disturbance from BLM Actions	1,500	1,400	1,500	1,500
Acres Reclaimed from BLM Actions	150	75	150	150
Acres Long-Term Disturbance from BLM Actions	1,350	1,325	1,350	1,350
Acres Short-Term Disturbance from Non-BLM Actions	600	600	600	600
Acres Reclaimed at Non-BLM Actions	450	450	450	450
Acres Long-Term Disturbance from Non-BLM Actions	150	150	150	150
Off-Highway Vehicles				
Acres Short-Term Disturbance from BLM Actions	1,000	0	1,000	1,000
Acres Reclaimed from BLM Actions	0	0	0	0
Acres Long-Term Disturbance from BLM Actions	1,000	0	1,000	1,000
Acres Short-Term Disturbance from Non-BLM Actions	1,000	1,000	1,000	1,000
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres Long-Term Disturbance from Non-BLM Actions	1,000	1,000	1,000	1,000
Recreation				
Acres Short-Term Disturbance from BLM Actions	60	40	60	60
Acres Reclaimed from BLM Actions	10	10	10	10
Acres Long-Term Disturbance from BLM Actions	50	30	50	50
Acres Short-Term Disturbance from Non-BLM Actions	70	70	70	70
Acres Reclaimed from Non-BLM Actions	20	20	20	20
Acres Long-Term Disturbance from Non-BLM Actions	50	50	50	50

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions (Continued)

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Renewable Energy – Wind Energy Development				
Acres of Short-Term Disturbance from BLM Actions	134,400	40,320	134,400	67,200
Acres Reclaimed from BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from BLM Actions	134,400	40,320	134,400	67,200
Acres of Short-Term Disturbance from Non-BLM Actions	141,360	141,360	141,360	141,360
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from Non-BLM Actions	141,360	141,360	141,360	141,360
Rights-of-Way				
Telephone and Fiber Optics				
Acres of Short-Term Disturbance from BLM Actions	1,371	1,371	1,371	1,371
Acres Reclaimed from BLM Actions	1,371	1,371	1,371	1,371
Acres of Long-Term Disturbance from BLM Actions	0	0	0	0
Acres of Short-Term Disturbance from Non-BLM Actions	5	5	5	5
Acres Reclaimed from Non-BLM Actions	5	5	5	5
Acres of Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Pipelines (Large-capacity [10"-36"])				
Acres of Short-Term Disturbance from BLM Actions	6,000	6,000	6,000	6,000
Acres Reclaimed from BLM Actions	6,000	6,000	6,000	6,000
Acres of Long-Term Disturbance from BLM Actions	0	0	0	0
Acres of Short-Term Disturbance from Non-BLM Actions	0	0	0	0
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from Non-BLM Actions	0	0	0	0

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions (Continued)

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Pipelines (Water)				
Acres of Short-Term Disturbance from BLM Actions	60	60	60	60
Acres Reclaimed from BLM Actions	60	60	60	60
Acres of Long-Term Disturbance from BLM Actions	0	0	0	0
Acres of Short-Term Disturbance from Non-BLM Actions	5	5	5	5
Acres Reclaimed from Non-BLM Actions	5	5	5	5
Acres of Long-Term Disturbance from Non-BLM Actions	0	0	0	0
Roads				
Acres of Short-Term Disturbance from BLM Actions	2,256	2,112	2,256	2,256
Acres Reclaimed from BLM Actions	550	550	550	550
Acres of Long-Term Disturbance from BLM Actions	1,706	1,562	1,706	1,706
Acres of Short-Term Disturbance from Non-BLM Actions	1,892	1,892	1,892	1,892
Acres Reclaimed from Non-BLM Actions	550	550	550	550
Acres of Long-Term Disturbance from Non-BLM Actions	1,342	1,342	1,342	1,342
Powerlines				
Acres of Short-Term Disturbance from BLM Actions	1,740	1,740	1,740	1,740
Acres Reclaimed from BLM Actions	8	8	8	8
Acres of Long-Term Disturbance from BLM Actions	1,732	1732	1,732	1,732
Acres of Short-Term Disturbance from Non-BLM Actions	5	5	5	5
Acres Reclaimed from Non-BLM Actions	5	5	5	5
Acres of Long-Term Disturbance from Non-BLM Actions	0	0	0	0

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions (Continued)

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Communication Sites				
Acres of Short-Term Disturbance from BLM Actions	28	28	28	28
Acres Reclaimed from BLM Actions	6	6	6	6
Acres of Long-Term Disturbance from BLM Actions	22	22	22	22
Acres of Short-Term Disturbance from Non-BLM Actions	42	42	42	42
Acres Reclaimed from Non-BLM Actions	10	10	10	10
Acres of Long-Term Disturbance from Non-BLM Actions	32	32	32	32
Other Facilities				
Acres of Short-Term Disturbance from BLM Actions	365	365	365	365
Acres Reclaimed from BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from BLM Actions	365	365	365	365
Acres of Short-Term Disturbance from Non-BLM Actions	365	365	365	365
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from Non-BLM Actions	365	365	365	365
Travel Management				
Road Maintenance				
Acres of Short-Term Disturbance from BLM Actions	35	35	35	35
Acres Reclaimed from BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from BLM Actions	35	35	35	35
Acres of Short-Term Disturbance from Non-BLM Actions	105	105	105	105
Acres Reclaimed from Non-BLM Actions	0	0	0	0
Acres of Long-Term Disturbance from Non-BLM Actions	105	105	105	105

Table M-1. Surface Disturbance from Reasonable Foreseeable Actions (Continued)

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Vegetation – Chemical Treatments				
Acres of Short-Term Disturbance from BLM Actions	5,000	0	5,000	5,000
Acres Reclaimed from BLM Actions (see note below)	4,950	0	4,950	4,950
Acres of Long-Term Disturbance from BLM Actions	50	0	50	50
Acres of Short-Term Disturbance from Non-BLM Actions	7,500	7,500	7,500	7,500
Acres Reclaimed from Non-BLM Actions	6,000	6,000	6,000	6,000
Acres of Long-Term Disturbance from Non-BLM Actions	1,500	1,500	1,500	1,500
Vegetation – Mechanical Treatments (Excluding Hand Work)				
Acres of Short-Term Disturbance from BLM Actions	2,000	0	2,000	2,000
Acres Reclaimed from BLM Actions (see note below)	1,980	0	1,980	1,980
Acres of Long-Term Disturbance from BLM Actions	20	0	20	20
Acres of Short-Term Disturbance from Non-BLM Actions	5,000	5,000	5,000	5,000
Acres Reclaimed from Non-BLM Actions	4,500	4,500	4,500	4,500
Acres of Long-Term Disturbance from Non-BLM Actions	500	500	500	500
Cumulative Disturbance				
Total Acres Short-Term Disturbance from BLM Actions	214,120	106,175	172,967	147,262
Total Acres Reclaimed from BLM Actions	69,447	58,482	28,500	69,721
Total Acres Long-Term Disturbance from BLM Actions	144,673	47,693	144,467	77,541
Total Acres Short-Term Disturbance from Non-BLM Actions	185,498	185,498	185,898	185,898
Total Acres Reclaimed from Non-BLM Actions	32,618	32,618	32,818	32,818
Total Acres Long-Term Disturbance from Non-BLM Actions	152,880	152,880	153,080	153,080
Cumulative Long-Term Acres of Disturbance	**297,553**	**200,573**	**297,547**	**230,621**

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Table M-2. Reasonable Foreseeable Development for Oil and Gas

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Mineral Resources – Oil and Gas Federal Well Projections				
Existing Productive Federal Wells				
Number of Existing Federal Wells	596	596	596	596
Projected Number of Abandoned Existing Federal Wells	134	134	134	134
Remaining Number of Existing Productive Federal Wells	**462**	**462**	**462**	**462**
Projected New Federal Wells				
Number of Projected New Federal Wells	1,012	608	1,020	1,010
Projected Number of Abandoned New Federal Wells	146	88	156	152
Projected Productive New Federal Wells	**866**	**520**	**864**	**858**
Projected Total Productive Federal Wells				
Remaining Number of Existing Productive Federal Wells	462	462	462	462
Projected Productive New Federal Wells	866	520	864	858
Total Number Productive Federal Wells	**1,328**	**982**	**1,326**	**1,320**
Nonfederal Well Projections (State and Fee Minerals)				
Existing Productive Nonfederal Wells				
Number of Existing Nonfederal Wells	759	759	759	759
Projected Number of Abandoned Nonfederal Wells	154	154	154	154
Remaining Number of Existing Productive Nonfederal Wells	**605**	**605**	**605**	**605**
Projected New Nonfederal Wells				
Number of Projected New Nonfederal Wells	1,459	1,459	1,459	1,459
Projected Number of Abandoned New Nonfederal Wells	216	216	216	216
Projected Productive New Nonfederal Wells	**1,243**	**1,243**	**1,243**	**1,243**

Table M-2. Reasonable Foreseeable Development for Oil and Gas (Continued)

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Mineral Resources – Oil and Gas Federal Well Projections				
Projected Total Productive Nonfederal Wells				
Remaining Number of Existing Productive Nonfederal Wells	605	605	605	605
Projected Productive New Nonfederal Wells	1,243	1,243	1,243	1,243
Total Number Productive Nonfederal Wells	**1,848**	**1,848**	**1,848**	**1,848**
Cumulative Productive Wells				
Total Number Productive Federal Wells	1,328	982	1,326	1,320
Total Number Productive Nonfederal Wells	1,848	1,848	1,848	1,848
Total Productive Wells	**3,176**	**2,830**	**3,174**	**3,168**

Table M-3. Reasonable Foreseeable Development for Development Other than Oil and Gas

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Mineral Resources – Coal				
We have one active coal operation (Pittsburg and Midway), with existing federal coal leases involved.	This alternative's acreage includes possible surface mining on a new area, the Pittsburg and Midway North Block, which involves existing federal coal leases and some private land.	Same comment as A	This alternative includes the North Block (see Alternative A), as well as the proposed Haystack surface coal mine. Mining on Haystack may occur approximately 10 years after RMP approval.	Same comment as C
Mineral Resources – Other Solid Leasables				
Only anticipated disturbance in regards to other solid leasable minerals is for trona (sodium). Surface disturbance includes anticipated drilling, pipelines, roads, and so on, for tailings injection into abandoned mine workings, water monitoring, trona exploration, and for solution mining of trona. Other surface disturbance includes borrow pits for fill dirt to construct berms around tailings ponds. No new conventional underground mines are anticipated during the life of the plan.				
Mineral Resources – Salables				
Additional refinement of acreages for private land salable mineral disturbance may be obtained from the Wyoming DEQ – Lander. Also see note under Locatables section (i.e., acreage for salables could increase and locatables decrease).				
There are presently 24 FHA materials sites authorized, for a total of 1,930 acres. Over the last 20 years, 16 sites were authorized, for a total of 1,313 acres. For the four alternatives, we can assume that over a 20 year period, we would authorize 1,300 acres for FHA materials sites.				

Table M-3. Reasonable Foreseeable Development for Development Other than Oil and Gas (Continued)

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Mineral Resources – Locatable Minerals				
We have one ongoing building stone operation and two proposed. Some or most of these acreages could end up in the salable category, depending on the outcome of common variety determinations for building stone on the individual areas.		Other Management Areas could significantly affect one proposed operation.		Same comment as B
Fire and Fuels Management				
Management Ignited Prescribed Fire	2,000 acres/year	2,000 acres/year	0 acres/year	2,000 acres/year
Fuels Management	150 acres/year	150 acres/year	0 acres/year	150 acres/year
Acres reclaimed from fuels/veg mgt projects are presumed to naturally revegetate. The BLM does not anticipate implementing reclamation in these areas.				
Invasive Nonnative Species - *The projected numbers may be limited by budget available. These estimates are best available information based on recent management efforts and emphasis on noxious weed control.*				
Control of noxious weeds and nonnative plants, unrelated to surface disturbance projects	1,000 acres/year	1,000 acres/year	1,000 acres/year	1,000 acres/year
Range Improvement Projects	100 acres/year	100 acres/year	100 acres/year	100 acres/year
Prescribed Fire	100 acres/year	100 acres/year	0 acres/year	100 acres/year
Chemical Treatments (Spike)	20 acres/year	0 acres/year	20 acres/year	20 acres/year
Mechanical Treatments	20 acres/year	0 acres/year	20 acres/year	20 acres/year
BLM Road Maintenance: Assumes 8 feet either side of road	400 miles/year	400 miles/year	400 miles/year	400 miles/year
Forests and Woodlands	1,000 acres	600 acres	1,600 acres	3,200 acres
Federal Oil and Gas Well Activities: Assumes 40 percent requires treatment on short-term disturbance and 15 percent requires treatment on long-term disturbance.				
Renewable Energy Projects: Assumes 10 percent requires treatment.				
ROWs: Assumes 10 percent requires treatment.				

Table M-3. Reasonable Foreseeable Development for Development Other than Oil and Gas (Continued)

Type of Development	Alternative A	Alternative B	Alternative C	Alternative D (Preferred Alternative)
Lands and Realty				
Wind Energy	Applications on file for wind testing	All acres within the planning area minus the restricted area of 33,345 acres associated with Raymond Mountain and the Bridger Antelope Trap	Acres based on map showing areas available for development	Acres based on map showing areas available for development
Projections on ROW do not include mineral development associated actions. They are based on historic activity of the last 20 years.				
Projected BLM roads based on securing access to the areas as described in the alternatives – estimated at 2 miles per road for this exercise.				
Other facilities are leases, such as airport leases, R&PP leases, land use permits, and so on.				
Livestock Grazing				
Spring Development – Total Number of Projects	50	50	50	50
Well Development – Total Number of Projects	20	20	20	20
Pipeline Development – Total Number of Projects	15	15	15	15
Fence Development – Total Number of Projects	75	75	75	75
Reservoir Maintenance Development– Total Number of Projects	34	34	34	34

BLM	Bureau of Land Management
DEQ	Department of Environmental Quality
FHA	Federal Highway Administration
R&PP	Recreation and Public Purposes
RMP	Resource Management Plan
ROW	rights-of-way

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APPENDIX N

Wyoming Bureau of Land Management Mitigation Guidelines for Surface-Disturbing and Disruptive Activities

Appendix N
Wyoming Bureau of Land Management Mitigation Guidelines for Surface-Disturbing and Disruptive Activities

Wyoming Mitigation Guidelines are a compilation of practices employed by Bureau of Land Management (BLM) to mitigate impacts from surface disturbance. They apply to activities such as road or pipeline construction, range improvements, and permitted recreation activities. The guidelines are designed to protect resources such as soils and vegetation, wildlife habitat, and cultural or historic properties. The guidelines are presented as an appendix of the Resource Management Plan (RMP) Environmental Impact Statement (EIS) for easy reference as they apply to many resources and derive from many laws. All BLM RMPs have included these guidelines as appendices. Public comment on the guidelines, per se, has not been requested. The guidelines are not land use decisions; rather they are examples of mitigation measures that could be applied, as appropriate, based on site-specific National Environmental Policy Act (NEPA) analysis for individual proposals. Comment on the use and application of specific mitigation measures can be made during the NEPA process for individual proposals. Because mitigation measures change or are modified, based on new information, the guidelines are updated periodically for all Field Offices in Wyoming.

These guidelines are primarily for the purpose of attaining statewide consistency in how requirements are determined for avoiding and mitigating environmental impacts and resource and land use conflicts. Consistency in this sense does not mean that identical requirements would be applied for all similar types of land use activities that may cause similar types of impacts. Nor does it mean that the requirements or guidelines for a single land use activity would be identical in all areas.

There are two ways the mitigation guidelines are used in the RMP and EIS process: (1) as part of the planning criteria in developing the RMP alternatives; and (2) in the analytical processes of both developing the alternatives and analyzing the impacts of the alternatives. In the first case, an assumption is made that any one or more of the mitigations will be appropriately included as conditions of relevant actions being proposed or considered in each alternative. In the second case, the mitigations are used (1) to develop a baseline for measuring and comparing impacts among the alternatives; (2) to identify other actions and alternatives that should be considered; and (3) to help determine whether more stringent or less stringent mitigations should be considered.

The EIS for the RMP does not decide or dictate the exact wording or inclusion of these guidelines. Rather, the guidelines are used in the RMP EIS process as a tool to help develop the RMP alternatives and to provide a baseline for comparative impact analysis in arriving at RMP decisions. These guidelines will be used in the same manner in analyzing activity plans and other site-specific proposals. These guidelines and their wording are matters of policy. As such, specific wording is subject to change primarily through administrative review, not through the RMP EIS process. Any further changes that may be made in the continuing refinement of these guidelines and any development of program-specific standard stipulations will be handled in another forum, including appropriate public involvement and input.

Purpose

The purposes of the "Wyoming BLM Mitigation Guidelines" are (1) to reserve, for the BLM, the right to modify the operations of all surface and other human presence disturbance activities as part of the statutory requirements for environmental protection; and (2) to inform a potential lessee, permittee, or operator of the requirements that must be met when using BLM-administered public lands. These guidelines have been written in a format that will allow for (1) their direct use as stipulations, and (2) the addition of specific or specialized mitigation following the submission of a detailed plan of development or other project proposal, and an environmental analysis.

Those resource activities or programs currently without a standardized set of permit or operation stipulations can use the mitigation guidelines as stipulations or as conditions of approval, or as a baseline for developing specific stipulations for a given activity or program.

Because use of the mitigation guidelines was integrated into the RMP EIS process and will be integrated into the site-specific environmental analysis process, the application of stipulations or mitigation requirements derived through the guidelines will provide more consistency with planning decisions and plan implementation than has occurred in the past. Application of the mitigation guidelines to all surface and other human presence disturbance activities concerning BLM-administered public lands and resources will provide more uniformity in mitigation than has occurred in the past.

Mitigation Guidelines

Surface Disturbance Mitigation Guideline

Surface disturbance will be prohibited in any of the following areas or conditions. Exception, waiver, or modification of this limitation may be approved in writing, including documented supporting analysis, by the authorized officer.

- Slopes in excess of 25 percent.
- Within important scenic areas (Class I and II Visual Resource Management Areas).
- Within 500 feet of surface water and/or riparian areas.
- Within either one-quarter mile or the visual horizon (whichever is closer) of historic trails.
- Construction with frozen material or during periods when the soil material is saturated or when watershed damage is likely to occur.

Guidance

The intent of the surface disturbance mitigation guideline is to inform interested parties (potential lessees, permittees, or operators) that when one or more of the five conditions exist, surface-disturbing activities will be prohibited unless or until a permittee or his designated representative and the surface management agency arrive at an acceptable plan for mitigation of anticipated impacts. This negotiation will occur prior to development.

Specific criteria (e.g., 500 feet from water) have been established based upon the best information available. However, such items as geographical areas and seasons must be delineated at the field level. Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, and applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

Wildlife Mitigation Guideline

A. To protect important big game winter habitat, activities or surface use will not be allowed from November 15 to April 30 within certain areas encompassed by the authorization. The same criteria apply to defined big game birthing areas from May 1 to June 30.

Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the authorized officer.

B. To protect important raptor and/or sage and sharp-tailed grouse nesting habitat, activities or surface use will not be allowed from February 1 to July 31 within certain areas encompassed by the authorization. The same criteria apply to defined raptor and game bird winter concentration areas from November 15 to April 30.
Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the authorized officer.

C. No activities or surface use will be allowed on that portion of the authorization area identified within (legal description) for the purpose of protecting (e.g., sage/sharp-tailed grouse breeding grounds, and/or other species/activities) habitat.
Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the authorized officer.

D. Portions of the authorized use area legally described as (legal description), are known or suspected to be essential habitat for (name) which is a threatened or endangered species. Prior to conducting any onsite activities, the lessee/permittee will be required to conduct inventories or studies in accordance with BLM and U.S. Fish and Wildlife Service guidelines to verify the presence or absence of this species. In the event that (name) occurrence is identified, the lessee/permittee will be required to modify operational plans to include the protection requirements of this species and its habitat (e.g., seasonal use restrictions, occupancy limitations, facility design modifications).

Guidance

The Wildlife Mitigation Guideline is intended to provide two basic types of protection: seasonal restriction and prohibition of activities or surface use (2c). Item 2d is specific to situations involving threatened or endangered species. Legal descriptions will ultimately be required and should be measurable and legally definable. There are no minimum subdivision requirements at this time. The area delineated can and should be defined as necessary, based upon current biological data, prior to the time of processing an application and issuing the use authorization. The legal description must eventually become a part of the condition for approval of the permit, plan of development, and/or other use authorization.

The seasonal restriction section identifies three example groups of species and delineates three similar time frame restrictions. The big game species including elk, moose, deer, antelope, and bighorn sheep, all require protection of crucial winter range between November 15 and April 30. Elk and bighorn sheep also require protection from disturbance from May 1 to June 30, when they typically occupy distinct calving and lambing areas. Raptors include eagles, accipiters, falcons (peregrine, prairie, and merlin), buteos (ferruginous and Swainson's hawks), osprey, and burrowing owls. The raptors and sage and sharp-tailed grouse require nesting protection between February 1 and July 31. The same birds often require protection from disturbance from November 15 through April 30 while they occupy winter concentration areas.

Item 2c, the prohibition of activity or surface use, is intended for protection of specific wildlife habitat areas or values within the use area that cannot be protected by using seasonal restrictions. These areas or values must be factors that limit life-cycle activities (e.g., sage-grouse strutting grounds, known threatened and endangered species habitat).

Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

Cultural Resource Mitigation Guideline

When a proposed discretionary land use has potential for affecting the characteristics which qualify a cultural property for the National Register of Historic Places (NRHP), mitigation will be considered. In accordance with Section 106 of the Historic Preservation Act, procedures specified in 36 Code of Federal Regulation (CFR) 800 will be used in consultation with the Wyoming State Historic Preservation Officer and the Advisory Council on Historic Preservation in arriving at determinations regarding the need and type of mitigation to be required.

Guidance

The preferred strategy for treating potential adverse effects on cultural properties is “avoidance.” If avoidance involves project relocation, the new project area may also require cultural resource inventory. If avoidance is imprudent or unfeasible, appropriate mitigation may include excavation (data recovery), stabilization, monitoring, protection barriers and signs, or other physical and administrative measures.

Reports documenting results of cultural resource inventory, evaluation, and the establishment of mitigation alternatives (if necessary) shall be written according to standards contained in BLM Manuals, the cultural resource permit stipulations, and in other policy issued by the BLM. These reports must provide sufficient information for Section 106 consultation. Reports shall be reviewed for adequacy by the appropriate BLM cultural resource specialist. If cultural properties on, or eligible for, the NRHP are located within these areas of potential impact and cannot be avoided, the authorized officer shall begin the Section 106 consultation process in accordance with the procedures contained in 36 CFR 800.

Mitigation measures shall be implemented according to the mitigation plan approved by the BLM authorized officer. Such plans are usually prepared by the land use applicant according to BLM specifications. Mitigation plans will be reviewed as part of Section 106 consultation for NRHP eligible or listed properties. The extent and nature of recommended mitigation shall be commensurate with the significance of the cultural resource involved and the anticipated extent of damage. Reasonable costs for mitigation will be borne by the land use applicant. Mitigation must be cost effective and realistic. It must consider project requirements and limitations, input from concerned parties, and be BLM approved or BLM formulated.

Mitigation of paleontological and natural history sites will be treated on a case-by-case basis. Factors such as site significance, economics, safety, and project urgency must be taken into account when making a decision to mitigate. Authority to protect (through mitigation) such values is provided for in FLPMA, Section 102(a)(8). When avoidance is not possible, appropriate mitigation may include excavation (data recovery), stabilization, monitoring, protection barriers and signs, or other physical and administrative protection measures.

Special Resource Mitigation Guideline

To protect (resource value), activities or surface use will not be allowed (i.e., within a specific distance of the resource value or between date to date) in (legal description).

Application of this limitation to operation and maintenance of a developed project must be based on environmental analysis of the operational or production aspects.

Exception, waiver, or modification of this limitation in any year may be approved in writing, including documented supporting analysis, by the authorized officer.

Example Resource Categories (Select or identify category and specific resource value):

a. Recreation areas.
b. Special natural history or paleontological features.
c. Other management areas.
d. Sections of major rivers.
e. Prior existing rights-of-way.
f. Occupied dwellings.
g. Other (specify).

Guidance

The *Special Resource Mitigation Guideline* is intended for use only in site-specific situations where one of the first three general mitigation guidelines will not adequately address the concern. The resource value, location, and specific restrictions must be clearly identified. A detailed plan addressing specific mitigation and special restrictions will be required prior to disturbance or development and will become a condition for approval of the permit, plan of development, or other use authorization.

Exception, waiver, or modification of requirements developed from this guideline must be based upon environmental analysis of proposals (e.g., activity plans, plans of development, plans of operation, applications for permit to drill) and, if necessary, must allow for other mitigation to be applied on a site-specific basis.

No Surface Occupancy Guideline

No Surface Occupancy (NSO) for fluid minerals will be allowed on the following described lands (legal description) because of (resource value).

Example Resource Categories (Select or identify category and specific resource value):

a. Recreation Areas (e.g., campgrounds, historic trails, national monuments).

b. Major reservoirs/dams.

c. Other management area (e.g., known threatened or endangered species habitat, areas suitable for consideration for wild and scenic rivers designation).

d. Other (specify).

Guidance

The *No Surface Occupancy Mitigation Guideline* is intended for use only when other mitigation is determined insufficient to adequately protect the public interest and is the only alternative to "no development" or "no leasing." The legal description and resource value of concern must be identified and be tied to an NSO for fluid minerals land use planning decision.

Waiver of, or exception(s) to, the NSO for fluid minerals requirement will be subject to the same test used to initially justify its imposition. If, upon evaluation of a site-specific proposal, it is found that less restrictive mitigation would adequately protect the public interest or value of concern, then a waiver or exception to the NSO for fluid minerals requirement is possible. The record must show that because conditions or uses have changed, less restrictive requirements will protect the public interest. An environmental analysis must be conducted and documented (e.g., environmental assessment, environmental impact statement, etc., as necessary) in order to provide the basis for a waiver or exception to an NSO planning decision. Modification of the NSO for fluid minerals requirement will pertain only to refinement or correction of the location(s) to which it applied. If the waiver, exception, or modification is found to be consistent with the intent of the planning decision, it may be granted. If found inconsistent with the intent of the planning decision, a plan amendment would be required before the waiver, exception, or modification could be granted.

When considering the “no development” or “no leasing” option, a rigorous test must be met and fully documented in the record. This test must be based upon stringent standards described in the land use planning document. Since rejection of all development rights is more severe than the most restrictive mitigation requirement, the record must show that consideration was given to development subject to reasonable mitigation, including “no surface occupancy.” The record must also show that other mitigation was determined to be insufficient to adequately protect the public interest. A “no development” or “no leasing” decision should not be made solely because it appears that conventional methods of development would be unfeasible, especially where an NSO restriction for fluid minerals may be acceptable to a potential permittee. In such cases, the potential permittee should have the opportunity to decide whether or not to go ahead with the proposal (or accept the use authorization), recognizing that an NSO restriction for fluid minerals is involved.

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APPENDIX O

Best Management Practices

Appendix O
Best Management Practices

Best management practices (BMPs) are environmental protection measures developed by governmental bodies, industry, and scientific or other working groups. These practices are not stipulations, but rather serve to improve design and reduce the environmental impact of proposed Bureau of Land Management (BLM) management actions in the planning area. Public land users are encouraged to review these practices, incorporate them where appropriate, or develop better methods for achieving the same goal.

The purpose of this section is not to attempt to select certain practices or designs and require that only those be used. It is not possible to evaluate all the known practices and make determinations as to which are best. What is best must be determined as a result of a site-specific investigation of the proposed management action. No one management practice is best suited to every site or situation. BMPs must be adaptive and monitored regularly to evaluate effectiveness.

The following sources contain significant information regarding the development and implementation of BMPs. These references are not to be considered as exclusive sources of information; rather, they should be used as a starting point when evaluating specific BMPs during the project design and implementation.

Wyoming Department of Environmental Quality
http://deq.state.wy.us/wqd/watershed/#Planning

Bureau of Land Management
http://www.blm.gov/bmp/
http://www.blm.gov/nhp/efoia/wo/fy05/im2005-069.htm

U.S. Environmental Protection Agency
http://www.epa.gov/owow/nps/
http://cfpub.epa.gov/npdes/stormwater/menuofbmps/menu.cfm

U.S. Department of Agriculture – Natural Resources Conservation Service
http://www.nrcs.usda.gov/Technical/Standards/nhcp.html
http://www.glti.nrcs.usda.gov/technical/publications/nrph.html

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GLOSSARY

Glossary

Administratively Unavailable for Oil and Gas Leasing: An administrative decision to indefinitely postpone offering lands for lease subject to further National Environmental Policy Act analysis that demonstrates that the objectives for initially holding lands from lease offering can be alternatively met or no longer apply.

Allotment: An area of land where one or more livestock operators graze their livestock. Allotments are Bureau of Land Management (BLM) lands, but may also include other federally managed, state-owned, and private lands. An allotment may include one or more separate pastures. Livestock numbers and periods of use are specified for each allotment. Allotments are classified by the following:

Category I – Improve Existing Resource Conditions
Category M – Maintain Existing Resource Conditions
Category C – Custodial Management.

Analysis Area: Any lands, regardless of jurisdiction, for which the BLM synthesizes, analyzes, and interprets data for information that relates to planning for BLM-administered lands.

Animal Unit Month (AUM): A standardized measurement of the amount of forage necessary for the sustenance of one cow unit or its equivalent for 1 month (approximately 800 pounds of forage).

Best Management Practices (BMPs): A suite of techniques that guide, or may be applied to, management actions to aid in achieving desired outcomes. BMPs often are developed in conjunction with land use plans, but they are not considered a land use plan decision unless the land use plan specifies that they are mandatory. They may be updated or modified without a plan amendment if they are not mandatory (BLM Manual Handbook H-1601-1).

Big Game Crucial Winter Range: Winter habitats on which wildlife species depend for survival. Because of severe weather conditions or other limiting factors, no alternative habitats would be available.

Borrow Material: A construction-related term that refers to unprocessed material excavated from a borrow pit for use as fill at another location.

Carbon Dioxide Flood: An enhanced oil recovery technique that injects fluid into the reservoir. When carbon dioxide is injected, it mixes with the oil and the two compounds dissolve into one another. The injected carbon dioxide acts as a solvent to overcome forces that trap oil in tiny rock pores and helps sweep the immobile oil left behind after the effectiveness of water injection decreases, resulting in increased oil production (EnCana 2005).

Checkerboard Land Pattern: Alternating sections of federally owned lands and private or state lands on either side of the Union Pacific Railroad in Southwestern Wyoming. This pattern of land ownership looks like a checkerboard on maps, using different colors to show land status.

Class I Wells: Injection wells that are

(1) Wells used by generators of hazardous waste or owners or operators of hazardous waste management facilities to inject hazardous waste beneath the lowermost formation containing, within ¼ mile of the well bore, an underground source of drinking water.

(2) Other industrial and municipal disposal wells that inject fluid beneath the lowermost formation containing, within ¼ mile of the well bore, an underground source of drinking water.

(3) Radioactive waste disposal wells that inject fluid below the lowermost formation containing an underground source of drinking water within ¼ mile of the well bore.

Class II Wells: Injection wells

(1) That are brought to the surface in connection with natural gas storage operations, or conventional oil or natural gas production, and may be commingled with wastewaters from gas plants, which are an integral part of production operations, unless those waters are classified as a hazardous waste at the time of injection.

(2) For enhanced recovery of oil or natural gas.

(3) For storage of hydrocarbons that are liquid at standard temperature and pressure.

Closed: Generally denotes that an area is not available for a particular use or uses. Refer to specific definitions found in law, regulations, or policy guidance for application to individual programs.

Commodity: An economic good, such as a product of agriculture or mining.

Comprehensive Weed Management Plan: A plan for controlling invasive plant species that incorporates integrated weed management techniques and accounts for pertinent considerations, such as management actions and allocations affecting weeds.

Controlled Surface Use (CSU): Surface occupancy or use will be restricted or prohibited unless the operator and surface managing agency arrive at an acceptable plan for mitigation of anticipated impacts. Identified resource values require special operational constraints that may modify the lease rights. CSU is used for operating guidance, not as a substitute for the no surface occupancy or timing limitation stipulations.

Cultural Resource Inventory Levels: A three-tiered process for discovering, recording, and evaluating cultural resources.

(a) **Class I** - A review of existing literature and oral informant data combined with an analysis of a specific geographic region (e.g., an area of potential effect, drainage basin, resource area, etc.).

(b) **Class II** - A sampling survey usually aimed at developing and testing a predictive model of cultural resource distribution.

(c) **Class III** - An on-the-ground survey to discover, record, and evaluate cultural resources within a specific geographic area (e.g., usually an area of potential effect for a proposed undertaking).

dB (decibel): A unit of measurement of the loudness or strength of a signal. One decibel is considered the smallest difference in sound level that the human ear can discern. Decibels are a relative measurement derived from two signal levels: a reference input level and an observed output level. A decibel is the logarithm of the ratio of the two levels. One Bel is when the output signal is 10 times that of the input and 1 decibel is 1/10th of a Bel.

Designated Roads and Trails: Specific roads and trails on which some type of motorized vehicle use is allowed either seasonally or yearlong.

Desired Future Condition: Landscape conditions and management scenarios that should exist for a specific land area and for a specific resource (e.g., livestock grazing or wildlife) that meet the managing agency's vision statement and objectives for ecological, economic and social considerations.

Dispersed Recreation: Recreational activities are considered “dispersed” when they do not depend on developed facilities, such as campgrounds, playgrounds, or developed park areas. User density is often low relative to developed or intensive recreation. Activities thought of as examples of dispersed recreation include, but are limited to, primitive camping, hunting, hiking, and off-highway driving. Dispersed recreation is usually noncommercial.

Dispersed Uses: Certain activities occurring on BLM-administered lands that do not require specific authorizations and do not necessarily cause any appreciable disturbance or damage to the public lands. Camping, parking, picnicking, and recovering a harvested big game animal are examples of dispersed uses. These are activities that can normally be accomplished within a minimal distance of roads and vehicle trails. The public is allowed to pursue these activities *up to 300 feet away from roads* and trails, as long as such activities do not cause resource damage or create new roads or extend existing roads.

Ecological Site: Land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in that the site has the ability to produce distinctive kinds and amounts of vegetation and to respond to management. Ecological sites are defined and described in terms related to soil, species composition, and annual production.

Ephemeral Stream: A stream that flows only in direct response to precipitation and whose channel is at all times above the water table. Confusion over the distinction between intermittent and ephemeral streams may be minimized by applying Meinzer’s suggestion that the term “ephemeral” be arbitrarily restricted to streams that do not flow continuously for at least 30 days (Prichard et al. 1998). Ephemeral streams support riparian areas when streamside vegetation reflects the presence of permanent subsurface water.

Exceedance: An event in which measurements of ambient air quality are above the national ambient air quality standard (NAAQS) or Wyoming Department of Environmental Quality (DEQ) standard set for a particular pollutant. For example, an annual average nitrogen dioxide value of 110 micrograms per cubic meter ($\mu g/m^{3)}$ is an exceedance of both the NAAQS and Wyoming DEQ annual average standard for nitrogen dioxide of 100 $\mu g/m^3$.

Exclusion Areas: Areas with sensitive resource values where rights-of-way and 302 permits, leases, and easements would not be authorized.

Existing Roads and Trails: Routes existing prior to the date the off-highway vehicle designation is announced in the *Federal Register*. These regularly used routes may have been constructed and maintained or may be two-track routes created and maintained by the passage of motor vehicles.

Extensive Recreation Management Areas (ERMAs): These are areas where dispersed recreation is encouraged and where visitors have a freedom of recreational choice with minimal regulatory constraint.

Fire Management Plan: A plan that identifies appropriate strategies to achieve resource objectives, as well as identifies fire policy, objectives, and prescribed actions. A Fire Management Plan may include maps, charts, tables, and statistical data.

Fire Regime Condition Class: A classification of the amount of departure from the natural fire regime. The departure results in changes to one or more of the following ecological components: vegetation characteristics (e.g., species composition, structural stages, stand age, canopy closure, and mosaic pattern), fuel composition, fire frequency, severity, and pattern, and other associated disturbance (e.g., insect and disease mortality, grazing, and drought). The three condition classes are listed below.

(a) **Condition Class 1**

- The historic disturbance regime is largely intact and functioning (e.g., has not missed a fire-return interval)
- Potential intensity and severity of fire within historic range
- Effects of disease and insects within historic range
- Hydrologic functions within normal historic range
- Vegetation composition and structure resilient to disturbances
- Nonnative species currently not present or to a limited extent
- Low risk of loss for key ecosystem components

(b) **Condition Class 2**

- Moderate alterations to historic disturbance regime evident (e.g., missed one or more fire-return intervals)
- Effects of disease and insects pose an increased risk of loss of key community components
- Riparian areas and associated hydrologic function show measurable signs of adverse departure from historic conditions
- Vegetation composition and structure shifted toward conditions less resilient to disturbances
- Populations of nonnative species may have increased, increasing the risk of further increases following disturbance

(c) **Condition Class 3**

- Historic disturbance regime significantly altered; historic disturbance processes and impacts may be precluded (e.g., missed several fire-return intervals)
- Effects of disturbance (fire, insects, and disease) may cause significant or complete loss of key community components
- Hydrologic functions may be adversely altered; high potential for increased sedimentation and reduced streamflows
- Invasive nonnative species may be common and, in some cases, the dominant species on the landscape; disturbance will likely increase both the dominance and geographic extent of these invasive species
- Highly altered vegetation composition and structure predisposes community to disturbance events outside the range of historic availability; disturbance may have effects not observed or measured before

Fire-Return Interval: The number of years between two successive fire events at a specific site or area.

Flaring/Venting: The controlled burning (flare) or release (vent) of natural gas that cannot be processed for sale or use because of technical or economic reasons.

Floodplain Connectivity: Maintenance of lateral, longitudinal, and vertical pathways for biological and hydrological processes in the floodplain. Examples of failures to maintain connectivity could include culverts or levees that restrict flow in the floodplain and focus overbank flow into the channel.

Flushing Livestock: The holding of livestock in an invasive, nonnative plant species (INPS) seed-free area where they are fed an INPS seed-free diet for 72 hours, thus flushing INPS seed from the animals' digestive systems.

Foreground-Middle Ground Zone: An area that can be seen from a travel route for a distance of 3 miles (foreground) to 5 miles (middle ground) where management activities might be viewed. A distance from 5 to 15 miles is called the *Background Zone* and the area beyond 15 miles is called the *Seldom-Seen Zone.*

Geologic Resources: Resources associated with the scientific study of the Earth, including its composition, structure, physical properties, and history. Geologic resources commonly include the study of minerals (**mineralogy**) and rocks (**petrology**); the structure of the Earth (**structural geology**) and volcanic phenomena (**volcanology**); and landforms and the processes that produce them (**geomorphology** and **glaciology**).

Goal: A broad statement of a desired outcome. Goals usually are not quantifiable and may not have established timeframes for achievement.

Guzzler: A water development for wildlife.

HABS/HAER: The Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) is an integral component of the federal government's commitment to historic preservation. The program documents important architectural, engineering, and industrial sites throughout the United States and its territories. A complete set of HABS/HAER documentation, comprising measured drawings, large-format photographs, and written history, plays a key role in accomplishing the mission of creating an archive of American architecture and engineering and in better understanding what historic resources tell us about America's diverse ethnic and cultural heritage. To insure that such evidence is not lost to future generations, the HABS/HAER collections are archived at the Library of Congress, where they are available to the public.

Heavy Equipment Use: This phrase is used in fire management and is relative to limiting fire suppression tactics. In this context it refers to not using dozers, skidders, or graders in areas where important resource values are in need of protection. Fire engines and water tenders used during suppression activities would be allowed.

Held by Production: Leases that become productive and do not terminate until all wells on the lease have ceased production are "held by production."

Historic Property: Any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places.

Impact Analysis for Planning (IMPLAN 2000) Model: IMPLAN is a regional economic model that provides a mathematical accounting of the flow of money, goods, and services through a region's economy. The model provides estimates of how a specific economic activity translates into jobs and income for the region. It includes the "ripple effect" (also called the "multiplier effect") of changes in economic sectors that may not be directly impacted by management actions, but are linked to industries that are directly impacted. In IMPLAN, these ripple effects are termed indirect impacts (for changes in industries that sell inputs to the industries that are directly impacted) and induced impacts (for changes in household spending as household income increases or decreases due to the changes in production).

Integrated Weed Management: The use of all appropriate weed control measures, including fire and mechanical, chemical, biological, and cultural techniques, in an organized and coordinated manner on a site-specific basis.

Intermittent Stream: A stream that flows only at certain times of the year due to receiving water from springs or a surface source, such as melting snow in mountainous areas. Confusion over the distinction between intermittent and ephemeral streams may be minimized by applying Meinzer's suggestion that the term "intermittent" be arbitrarily restricted to streams that flow continuously for periods of at least 30 days (Prichard et al. 1998).

Land Tenure: To improve the manageability of Bureau of Land Management (BLM) lands and improve their usefulness to the public, the BLM has numerous authorities for "repositioning" lands into a more consolidated pattern, disposing of lands, and entering into cooperative management agreements. These land-pattern improvements are completed primarily through the use of land exchanges, but also through land sales, jurisdictional transfers to other agencies, and the use of cooperative management agreements and leases. These ownership or jurisdictional changes are referred as "Land-Tenure Adjustments."

Leasable Minerals: Those minerals or materials subject to lease by the federal government under the Mineral Leasing Act of 1920. Leasable minerals include coal, phosphate, asphalt, sulphur, potassium, oil shale, and sodium minerals, including trona. Oil and gas, as well as geothermal resources, also are included.

Lek: A traditional courtship display area attended by male sage-grouse in or adjacent to sagebrush dominated habitat. Designation of the site as a lek requires observation of two or more male sage-grouse engaged in courtship displays. In addition new leks must be confirmed by a survey conducted during the appropriate time of day and during the strutting season. Observation of sign of strutting activity can also be used to confirm a suspected lek.

Lek Complex: A group of leks in close proximity between which male sage-grouse may be expected to interchange from one day to the next. A specific distance criteria does not yet exist.

Lek Count: A census technique that documents the actual number of male sage-grouse observed on a particular lek or complex of leks using the methods described below.

Lek Survey: A monitoring technique designed primarily to determine whether leks are active or inactive and obtaining accurate counts of the numbers of males attending is secondary.

Annual status – Each year a lek will be determined to be in one of the following status categories:

Active: Any lek that has been attended by male sage-grouse during the strutting season. Presence can be documented by observation of birds using the site or by signs of strutting activity.

Inactive: Leks where it is known that there was no strutting activity through the course of a strutting season. A single visit, or even several visits, without strutting sage-grouse being seen is not adequate documentation to designate a lek as inactive. This designation requires either an absence of birds on the lek during multiple ground visits under ideal conditions throughout the strutting season or a ground check of the exact lek site late in the strutting season that fails to find any sign (droppings/feathers) of strutting activity.

Unknown: Leks that have not been documented either active or inactive during the course of a strutting season.

Based on annual status a lek may be put into one of the following categories for management purposes:

Occupied Lek: A lek that has been active during at least one strutting season within the last ten years. Management protection will be afforded to occupied leks.

Undetermined Lek: Any lek that has not been documented as being active in the last ten years but does not have sufficient documentation to be designated unoccupied. Management protection will be afforded to undetermined leks until their status has been documented as unoccupied.

Unoccupied Lek (formerly termed "historical lek"): There are two types of unoccupied leks, "destroyed" or "abandoned." Management protection will not be afforded to unoccupied leks.

Abandoned lek: A lek in otherwise suitable habitat that has not been active during a consecutive ten-year period. Before a lek is designated "abandoned" it must be confirmed as "inactive" (see above criteria) in at least four non-consecutive strutting seasons spanning the ten years. Once designated "abandoned", the site should be surveyed at least once every ten years to determine whether or not the lek has been reoccupied.

Destroyed lek: A formerly active lek site and surrounding sagebrush habitat that has been destroyed and no longer capable of supporting sage-grouse breeding activity. A lek site that has been strip-mined, paved, converted to cropland or undergone other long-term habitat type conversion is considered destroyed. Destroyed leks do not require monitoring unless the site is reclaimed to suitable sage-grouse habitat.

Migratory population: Sage-grouse that move more than 6.2 miles (10 km) between two or three seasonal ranges (Connelly et al. 2003).

Non-migratory population: Sage-grouse that do not move more that 6.2 miles (10 km) between seasonal ranges (Connelly et al. 2003).

Winter Concentration Area: An area where large numbers of sage-grouse have been documented to consistently use specific landscapes for winter habitat. Habitat characteristics include sagebrush that is generally 10-14 inches (25-36 cm) above the snow and sagebrush canopy cover above the snow that ranges from 10 to 30 percent. Topography tends to be on flat to generally southwest facing slopes or on ridges where sagebrush height may be less than 10 inches (25 cm) but the snow is routinely blown clear by wind. Winter concentration areas do not include all winter habitats used by sage-grouse, nor are they limited to more narrow "severe winter relief" habitats (a survival range). Delineation of these concentration areas is based on determination of the presence of winter habitat characteristics confirmed by repeated observations and/or sign of large numbers of sage-grouse. The definition of "large" is dependent on whether the overall population is large or small. In core population areas frequent observations of groups of 50+ sage-grouse meet the definition while in marginal populations group size may be 25+. Consultation and coordination with the WGFD is required when delineating winter concentration areas.

Livestock Conversion: Changing the kind of livestock allowed to graze an allotment, such as from sheep to cattle.

Locatable Minerals: The minerals are subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of 1872, as amended. Such minerals include deposits of metallic minerals, such as gold, silver, and other uncommon materials, not subject to lease or sale.

Mechanical Transport: Any nonmotorized vehicle, device, or contrivance for moving people or material over land, water, snow, or air that has moving parts. This includes, but is not limited to, sailboats, sailboards, hang gliders, parachutes, bicycles, game carriers, hand carts, wheel barrows, and wagons. The term does not include wheel chairs, nor does it include horses or other pack stock, skis, snowshoes, nonmotorized river craft, including, but not limited to, drift boats, rafts, and canoes, or sleds, travois, or similar devices without moving parts. The terms "mechanical transport" and "motor vehicle" are not synonymous.

Mechanized Vehicle Use: The use of land by mountain bikes.

Mineral Materials (Salable Minerals): Materials such as common varieties of sand, stone, gravel, pumice, pumicite, and clay that are not obtainable under the mining or leasing laws, but can be acquired through sale or free use permit under the Materials Act of 1947, as amended.

Mineral Withdrawal: A formal order that withholds federal lands and minerals from entry under the Mining Law of 1872, as amended, and closes the area to mineral location (i.e., staking mining claims) and development.

Mitigation:

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

Multiple Use Reservoir: A human-created lake or pond with a combination of balanced uses, including, but not limited to, recreation, livestock watering, watershed health, and wildlife and fish.

Native Species Status: Native Species Status (NSS) refers to the population status of species native to the area in which their habitats occur. The NSSs are divided into the following categories:

NSS1 **Native Species Status 1**

- Populations are greatly restricted or declining, extirpation appears possible; or ongoing significant loss of habitat.

NSS2 **Native Species Status 2**

- Populations are declining, extirpation appears possible; habitat is restricted or vulnerable, but no recent or ongoing significant loss; species may be sensitive to human disturbance OR
- Populations are declining or restricted in numbers and (or) distribution, extirpation is not imminent; ongoing significant loss of habitat.

NSS3 **Native Species Status 3**

- Populations are greatly restricted or declining, extirpation appears possible; habitat is not restricted, vulnerable, but no loss; species is not sensitive to human disturbance OR

- Populations are declining or restricted in numbers and (or) distribution, extirpation is not imminent; habitat is restricted or vulnerable, but no recent or ongoing significant loss species may be sensitive to human disturbance.
  OR
- Species is widely distributed; population status or trends are unknown, but are suspected to be stable; ongoing significant loss of habitat.

NSS4 **Native Species Status 4**

- Populations are greatly restricted or declining, extirpation appears possible; habitat is stable and not restricted.
  OR
- Populations are declining or restricted in numbers and (or) distribution, extirpation is not imminent; habitat is not restricted, vulnerable, but no loss; species is not sensitive to human disturbance
  OR
- Species is widely distributed, population status or trends are unknown, but are suspected to be stable; habitat is restricted or vulnerable, but no recent or ongoing significant loss; species may be sensitive to human disturbance
  OR
- Populations that are stable or increasing and not restricted in numbers and (or) distribution; ongoing significant loss of habitat.

Necessary Tasks: Necessary tasks are actions that support commercial or industrial uses of the public lands and which need to be accomplished by a person or organization seeking or holding an authorization from the BLM. These include tasks that are sometimes accomplished without formal written approval or in advance of receiving an authorization.

No Surface Occupancy (NSO): This is a term used to prohibit the physical presence of oil and gas operations and associated facilities on the surface of Public Lands in a specified area to protect sensitive surface resource values. The NSO provision is reserved for use in fluid mineral land use planning and allocation decisions and lease stipulations. Other terms, such as restricted area, avoidance area, exclusion area, etc., are used with non-fluid mineral functions.

Objective: A description of a desired condition for a resource. Objectives can be quantified and measured and, where possible, have established timeframes for achievement.

Off-Road Travel: Off-road travel means travel off of existing roads and trails, or driving cross-country.

Off-Highway Vehicle (OHV): Any motorized vehicle capable of, or designed for, travel on or immediately over land, water, or other natural terrain, excluding (1) any nonamphibious registered motorboat; (2) any military, fire, emergency, or law enforcement vehicle being used for emergency purposes; (3) any vehicle whose use is expressly authorized by the authorized officer, or otherwise officially approved; (4) vehicles in official use; and (5) any combat or combat support vehicle when used in times of national defense emergencies.

Off-Highway Vehicle (OHV) Management Designations: Designations apply to all off-road vehicles (ORVs) regardless of the purposes for which they are being used. Emergency vehicles are excluded. The ORV designation definitions have been developed in cooperation with representatives of the U.S. Forest Service, National Park Service, and the BLM state and field office personnel. The BLM recognizes the differences between ORVs and over-snow vehicles in terms of use and impact. Therefore, travel by over-snow vehicles will be permitted off existing routes and in all open or limited areas (unless otherwise specifically limited or closed to over-snow vehicles) if they are operated in a responsible manner without damaging the vegetation or harming wildlife.

Closed: Vehicle travel is prohibited in the area. Access by means other than motorized vehicle is permitted. This designation is used if closure to all vehicular use is necessary to protect resources, to ensure visitor safety, or to reduce conflicts.

Open: Vehicle travel is permitted in the area (both on and off roads) if the vehicle is operated responsibly in a manner not causing, or unlikely to cause, significant undue damage to or disturbance of the soil, wildlife, wildlife habitats, improvements, cultural or vegetative resources, or other authorized uses of the public lands. These areas are used for intensive OHV use where there are no compelling resource needs, user conflicts, or public safety issues to warrant limiting cross-country travel.

Limited:

a. Vehicle travel is permitted only on roads and vehicle routes that were in existence prior to the date of designation in the *Federal Register*. Vehicle travel off of existing vehicle routes is permitted only to accomplish necessary tasks and only if such travel does not result in resource damage. Random travel from existing vehicle routes is not allowed. Creation of new routes or extensions and (or) widening of existing routes are not allowed without prior written agency approval.

b. Vehicle travel is permitted only on roads and vehicle routes designated by the BLM. In areas where final designation has not been completed, vehicle travel is limited to existing roads and vehicle routes as described above. Designations are posted as follows:

   1. Vehicle route is open to vehicular travel.
   2. Vehicle route is closed to vehicular travel.

c. Vehicle travel is limited by number or type of vehicle. Designations are posted as follows:

   1. Vehicle route limited to four-wheel drive vehicles only.
   2. Vehicle route limited to motorbikes only.
   3. Area is closed to over-snow vehicles.

d. Vehicle travel is limited to licensed or permitted use.

e. Vehicle travel is limited to time or season of use.

f. Where specialized restrictions are necessary to meet resource management objectives, other limitations also may be developed.

The BLM may place other limitations, as necessary, to protect other resources, particularly in areas that motorized OHV enthusiasts use intensely or where they participate in competitive events.

Old-Growth Forest: Old-growth forests are ecosystems distinguished by old trees and related structural features. Old growth encompasses the later stages of stand development that typically differs from earlier stages in several ways, including tree size, accumulation of large dead woody material, number of canopy layers, species composition, and ecosystem function. Old-growth forest is typically distinguished by the following:

- Large-sized trees of specific species
- Wide variation in age classes and stocking levels
- Accumulations of large-sized dead standing and fallen trees
- Decadence in the form of broken or deformed tops and boles
- Multiple canopy layers
- Canopy interspaces and understory patchiness.

Old-Growth Forest Classifications for Engelmann Spruce, Douglas Fir, and Limber Pine

Engelmann Spruce – Subalpine fir (SAF Cover Type 206)				
	Live Trees (Warm/Moist Environment)	**Dead Trees (Warm/Moist Environment)**	**Live Trees (Cold/Dry Environment)**	**Dead Trees (Cold/Dry Environment)**
Diameter Breast Height (DBH) (inches)	> or equal 20	–	> or equal 15	–
Trees/Acre	> or equal 25	–	> or equal 15	–
Age	> or equal 220	–	> or equal 150 to 180	–
Variation in Tree Diameter	Yes	–	Yes	–
Tree Decadence	Evident dead, broken, or deformed tops and (or) bole or root rot	–	> or equal 2; DBH 14; evident dead, broken, or deformed tops and (or) bole or root rot	–
Multiple Tree Canopy Layers	Yes	–	Yes	–
Standing DBH (inches)/Height (feet)	–	> or equal 12/15	–	> or equal 10/15
Standing Trees/Acre	–	> or equal 2	–	2 to 4
Down Diameter (inches)	–	> or equal 12	–	> or equal 8 or > 6
Down Pieces/Acre – Length	–	> or equal 1 – 8 feet	–	> or equal 16 to 8 feet or 100 pieces > 8 feet

Douglas-fir (SAF Cover Type 210)				
	Live Trees (Higher Productivity Site)	**Dead Trees (Higher Productivity Site)**	**Live Trees (Lower Productivity Site)**	**Dead Trees (Lower Productivity Site)**
DBH (inches)	24	–	18	–
Trees/Acre	> or equal 15	–	10	–
Age	> or equal 200	–	200	–
Variation in Tree Diameter	Yes	–	Yes	–
Tree Decadence	Evident dead, broken, or deformed tops and (or) bole or root rot	–	> or equal 2; DBH 15; evident dead, broken, or deformed tops and (or) bole or root rot	–
Multiple Tree Canopy Layers	Yes	–	Yes	–
Standing DBH (inches)/Height (feet)	–	> or equal 20/20	–	16/10
Standing Trees/Acre	–	> or equal 1	–	0 to 3
Down Diameter (inches)	–	> or equal 12	–	> or equal 15
Down Pieces/Acre – Length	–	> or equal 0 to16 feet	–	Infrequent 4 - > or equal 8 feet

Old-Growth Forest Classifications for Engelmann Spruce, Douglas Fir, and Limber Pine (Continued)

Limber pine (SAF Cover Type 219)				
	Live Trees (Lower Timberline)	**Dead Trees (Lower Timberline)**	**Live Trees (Montaine Woodlands)**	**Dead Trees (Lower Productivity Site)**
DBH (inches)	> or equal 16	–	> or equal 1	–
Trees/Acre	> or equal 10	–	10	–
Age	> or equal 250	–	500	–
Variation in Tree Diameter	Yes	–	Yes	–
Tree Decadence	Evident dead, broken, or deformed tops and (or) bole or root rot	–	Evident dead, broken, or deformed tops and (or) bole or root rot	–
Multiple Tree Canopy Layers	Yes	–	No	–
Standing DBH (inches)/Height (feet)	–	N/A	–	N/A
Standing Trees/Acre	–	Few	–	Few
Down Diameter (inches)	–	N/A	–	N/A
Down Pieces/Acre – Length	–	Rare	–	Rare

Old-Growth Forest Classifications for Lodgepole Pine, Aspen, and Rocky Mountain Juniper

	Lodgepole pine (SAF Cover Type 218)		**Aspen (SAF Cover Type 217)**		**Rocky Mountain Juniper[1] (SAF Cover Type 220)**	
	Live Trees	**Dead Trees**	**Live Trees**	**Dead Trees**	**Live Trees**	**Dead Trees**
DBH (inches)	> or equal 11	–	> or equal 12	–	12	–
Trees/Acre	> or equal 25	–	> or equal 10 dry to 20 mesic	–	12	–
Age	> or equal 140	–	100	–	200	–
Variation in Tree Diameter	Yes	–	Yes	–	Yes	–
Tree Decadence (Trees/Acre – DBH [inches])	> or equal 2 to 11; evident dead, broken, or deformed tops and (or) bole or root rot	–	N/A	–	N/A	–
Multiple Tree Canopy Layers	Yes		Yes	–	N/A	–
Standing DBH/height feet	–	> or equal 11	–	> or equal 10/15	–	12/5
Standing Trees/Acre	–	5	–	2	–	> or equal .05
Down Diameter (inches)	–	> or equal 11	–	> or equal 8	–	> or equal 10
Down Pieces/Acre – Length	–	> or equal 50 to > or equal 8 feet	–	> or equal 10 – 10 feet	–	> or equal 2 to 5 feet

[1] Extrapolated old growth characteristics from Pinyon-Juniper Old Growth Characteristics

>	greater than
DBH	Diameter Breast Height
N/A	not available

Open: Generally denotes that an area is available for a particular use or uses. Refer to specific program definitions found in law, regulations, or policy guidance for application to individual programs.

Overgrazing: Continued heavy grazing that exceeds the recovery capacity of the forage plants and creates deterioration of the grazing lands (Valentine 1990).

Perennial Stream: A stream that flows continuously. Perennial streams generally are associated with a water table in the localities through which they flow (Prichard et al. 1998).

Pest: With the exception of vascular plants classified as invasive nonnative plant species, a pest can be any biological life form that poses a threat to human or ecological health and welfare. For the purposes of this planning effort, an "animal pest" is any vertebrate or invertebrate animal subject to control by the Animal and Plant Health Inspection Service (APHIS). APHIS is currently BLM's authorized agent for controlling "animal pests." For this reason, "animal pests" will be considered a subset of Pest.

Planning Area: A geographic area for which land use and resource management plans are developed and maintained.

Poor Topsoils: Soils that are highly erosive and (or) have low reclamation potential.

Prairie Dog Complex: A cluster of two or more prairie dog towns within 3 km of each other (Clark and Stromberg 1987, Luce 2003) and bounded by either natural or artificial barriers (Whicker and Detling 1988) that effectively isolate one cluster of colonies from interacting/interchanging with another. Prairie dogs may commonly move among colonies of a cluster, and thereby foster reproductive/genetic viability, but exhibit little emigration/immigration between clusters. A cluster may include some currently unoccupied, though physically suitable (i.e., vegetation, soils, topography etc.), lands immediately adjacent to occupied colonies that support other prairie dog-associated (ecosystem function) obligate or facultative species (e.g., swift fox, mountain plover, burrowing owl, etc.).

Prescribed Burning: Controlled application of fire to wildland fuels in either their natural or modified state under specified environmental conditions that allow the fire to be confined to a predetermined area and at the same time to produce the fire intensity and rate of spread required to attain planned resource management objectives.

Prescribed Fire: The introduction of fire to an area under regulated conditions for specific management purposes.

Priority Fish Species: Priority fish species are species considered to be sport fish and native species.

Probable Fossil Yield Classification: Geologic units in the planning area are classified according to the Probable Fossil Yield Classification, usually at the formation or member level, according to the probability of yielding resources of concern to land managers, primarily vertebrate fossils. The classification uses a ranking of 1 through 5, with Class 5 assigned to units with a high potential for fossils. Within the planning area, Class 4 and Class 5 geologic formations account for approximately 50 percent of the total acreage, including all ownerships. About 35 percent of public land in the planning area is underlain by Class 4 and Class 5 formations. The classifications are described below.

> **Class 1.** Igneous and metamorphic geologic units, or units with highly disturbed preservational environments that are not likely to contain recognizable fossil remains. Management concern is negligible for Class 1 resources and mitigation requirements are rare.

Class 2. Sedimentary geologic units that are not likely to contain vertebrate fossils or significant nonvertebrate fossils. Management concern is low for Class 2 resources and mitigation requirements are not likely.

Class 3. Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence, or units of unknown fossil potential. Management concern may extend across the entire range of management. Ground-disturbing activities require sufficient assessment to determine whether significant resources occur in the area of the proposed action.

Class 4. Class 4 units are Class 5 units with a lowered risk of human-caused adverse impacts or lowered risk of natural degradation. Ground-disturbing activities require assessment to determine whether significant resources occur in the area of the proposed action and whether those actions will impact the resource. Mitigation may include full monitoring of significant localities.

Class 5. Highly fossiliferous geologic units that regularly produce vertebrate fossils or significant nonvertebrate fossils and that are at risk of natural degradation or human-caused adverse impacts. Class 5 areas receive the highest level of management focus. Mitigation of ground-disturbing actions is required and may be intense. Areas of special interest may be designated and intensely managed.

Produced Water: Produced water is groundwater removed to facilitate the extraction of minerals, such as coal, oil, or gas.

Proper Functioning Condition: See Riparian/Wetland Functionality Classification

Proper Grazing: Proper grazing is the practice of managing forage use by grazing animals at a sustainable level that maintains rangeland health. Proper grazing will maintain or increase plant cover, including residue, which acts to slow down or reduce runoff, increase water infiltration, and keep erosion and sedimentation at or above acceptable levels within the potential of ecological sites within a given geographic area (e.g., watershed, grazing allotment, etc.).

Rangeland: Land on which the native vegetation is predominantly grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing. This includes lands revegetated naturally or artificially when routine management of that vegetation is accomplished mainly through manipulation of grazing. Rangelands include natural grasslands, savannas, shrublands, most deserts, tundra, alpine communities, coastal marshes, and wet meadows.

Rangeland Health: The degree to which the integrity of the soil and ecological processes of rangeland ecosystems are sustained.

Range Improvement Project: A structural improvement requiring placement or construction to facilitate management or control distribution and movement of grazing or browsing animals. Such improvements may include, but are not limited to, fences, wells, troughs, reservoirs, water catchments, pipelines, and cattleguards. The project also may include a practice or treatment that improves rangeland condition and or resource production for multiple use. Nonstructural types of projects may include, but are not limited to, seeding and plant control through chemical, mechanical, and biological means or through prescribed burning.

Raptor: A bird of prey with sharp talons and a strongly curved beak, such as hawks, falcons, owls, vultures, and eagles.

Reasonable Foreseeable Development (RFD) Scenario: An RFD Scenario for oil and gas is a long-term projection (scenario) of oil and gas exploration, development, production, and reclamation activity. The RFD covers oil and gas activity in a defined area for a specified period of time. The RFD projects a baseline scenario of activity assuming all potentially productive areas can be open under standard lease terms and conditions, except those areas designated as closed to leasing by law, regulation or executive order. The baseline RFD scenario provides the mechanism to analyze the effects that discretionary management decisions have on oil and gas activity. The RFD also provides basic information that is analyzed in the National Environmental Policy Act (NEPA) document under various alternatives (BLM 2004).

> **Unconstrained RFD Scenario:** The baseline RFD scenario. No management prescriptions management proposed conditions and (or) restrictions are applied when projecting future activities. Where legislatively imposed restrictions are applied to analyzed lands, those restrictions are considered when projecting future activities.
>
> **Constrained RFD Scenario:** An RFD scenario projected for each proposed alternative. Management prescriptions proposed for each alternative are considered when projecting future activities under the RFD scenario for each alternative. Where legislatively imposed restrictions are applied to analyzed lands, those restrictions are considered when projecting future activities for each alternative.

Recreation Management Areas: Recreation management areas are units within a planning area guiding recreation management on public lands having similar recreation-related issues and concerns. There are two types of recreation management areas, extensive and special.

> **Extensive Recreation Management Areas (ERMAs):** These are areas where dispersed recreation is encouraged and where visitors have a freedom of recreational choice with minimal regulatory constraint.
>
> **Special Recreation Management Areas (SRMAs):** These are areas where congressionally recognized recreation values exist *or* where significant public recreation issues or management concerns occur. Special or more intensive types of management typically are needed.

Recreation Opportunity Spectrum (ROS): The Recreation Opportunity Spectrum provides a framework for stratifying and defining classes of outdoor recreation opportunity environments. Possible mixes of activities, settings, and experience opportunities have been arranged along a spectrum—the Recreation Opportunity Spectrum. Each of several classes ranging from primitive to urban is defined in terms of its combination of activity, setting, and experience opportunities. ROS classes become an integral part of management prescriptions for recreation in the Resource Management Plan.

Reserve Pit: A pit that is intrinsically related to well drilling and is used to hold drilling fluids and cuttings during the well drilling.

Resource Damage: This type of damage is defined as leaving signs of vehicle use, such as wheel ruts in wet meadows, visual scars on hillsides, or soil erosion. Additional examples include surface disturbance that causes the loss of vegetative cover, degradation of wildlife habitats, the creation of new roads, and the introduction of noxious weeds. Damage to vegetation also includes crushing or uprooting trees and shrubs. The determination of whether resource damage has occurred is at the discretion of Field Managers and law enforcement personnel.

Restricted Disposal: Parcels identified for restricted disposal may be disposed of under the Recreation and Public Purposes Act (by example), may limit the disposal to a particular type of entity capable of preserving the resource values, or may include the use of covenants in the deed or land-sale patent to ensure the resource values are protected.

Riparian/Wetland Functionality Classification:

Desired Plant Community (DPC): Of the several plant communities that may occupy a site, the DPC is the community that has been identified through a management plan to best meet the plan's objectives for the site. At a minimum, it must protect the site.

Functional At-Risk: Riparian/wetland areas that are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

Potential Natural Community (PNC): The biotic community that would become established if all successional sequences were completed without interference by humans under the present environmental conditions. Natural disturbances are inherent in development. PNCs can include naturalized nonnative species.

Proper Functioning Condition: A riparian or wetland area is considered to be in proper functioning condition when adequate vegetation, landform, or large woody debris is present to do the following:

- Dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality
- Filter sediment, capture bedload, and aid floodplain development
- Improve floodwater retention and groundwater recharge
- Develop root masses that stabilize stream banks against cutting action
- Develop diverse ponding and channel characteristics to provide the habitats and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses
- Support greater biodiversity.

Nonfunctional: Riparian or wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows and, thus, are not reducing erosion, improving water quality, and so on, as listed above. The absence of certain physical attributes, such as a floodplain where one should be, is an indicator of nonfunctioning conditions.

Unknown: Riparian or wetland areas that the BLM lacks sufficient information on to make any form of determination.

Rights-of-Way (ROW): An ROW grant is an authorization to use a specific piece of public land for a specific project, such as roads, pipelines, transmission lines, and communication sites. The grant authorizes rights and privileges for a specific use of the land for a specific period of time.

ROW Avoidance Areas: Areas where negative routing factors exist. ROW either will not be granted in these areas or—if granted—will be subject to stringent terms and conditions. In other words, ROW would be *restricted* (but not necessarily prohibited) in these avoidance areas.

Salable Minerals (Mineral Materials): Common variety of minerals on public lands, such as sand and gravel, used mainly for construction. Salable minerals are disposed of by sales to the public or free-use permits to government agencies or nonprofit organizations.

Seasonal Ranges: The Wyoming Game and Fish Department has identified various ranges for big game species. These ranges are defined as follows:

> **Summer or Spring-Summer-Fall:** A population or portion of a population of animals uses the documented habitats within this range annually from the end of previous winter to the onset of persistent winter conditions.
>
> **Severe Winter Relief:** A documented survival range, which may or may not be considered a crucial range area as defined above. It is used to a great extent, but only in extremely severe winters. It may lack habitat characteristics that would make it attractive or capable of supporting major portions of the population during normal years, but is used by and allows at least a significant portion of the population to survive the occasional extremely severe winter.
>
> **Winter:** A population or portion of a population of animals uses the documented suitable habitat sites annually within this range in substantial numbers during the winter period only.
>
> **Winter/Yearlong:** A population or a portion of a population of animals makes general use of the documented suitable habitat sites within this range on a year-round basis. During the winter months there is a significant influx of additional animals into the area from other seasonal ranges.
>
> **Yearlong:** A population or substantial portion of a population of animals makes general use of the suitable documented habitat sites within the range on a year-round basis. On occasion, animals may leave the area under severe conditions.
>
> **Parturition Areas:** Documented birthing areas, commonly used by females, that include calving areas, fawning areas, and lambing grounds. These areas may be used as nurseries by some big game species.

Section 106 of National Historic Preservation Act: "The head of any Federal agency having direct or indirect jurisdiction over a proposed federal or federally assisted undertaking in any state and the head of any federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking" (16 United States Code 47 df).

Sensitive Sites or Resources: Sensitive sites or resources refer to significant cultural resources that are eligible or may be eligible for nomination to the National Register of Historic Places.

Sensitive Species: Species designated as sensitive by the BLM State Director include species that are under status review, have small or declining populations, live in unique habitats, or require special management (BLM 2001). BLM Manual 6840 provides policy and guidance for special status species management. The BLM Wyoming Sensitive Species Policy and List are provided in a memorandum updated annually. Primary goals of the BLM Wyoming policy include maintaining vulnerable species and habitat components in functional BLM ecosystems and preventing a need for species listing under the Endangered Species Act.

Seral Stage: One of a series of plant communities that follows another in time on a specific ecological site.

Setting: Setting is the physical environment of a historic property and how the property evokes a sense of feeling and association with past events. Accordingly, setting referees to the **character** of the place in which the property played its historic role. It involves **how**, not just where, the property is situated and its relationship to surrounding features and open space. These features and their relationships should be considered not only within the exact boundaries of the property, but also between the property and its surroundings.

Significant Cultural Sites: The planning area contains sites that are identified for special management objectives because of their unusual historical, cultural, scientific, or traditional values among the many other sites in the planning area that are evaluated eligible to the National Register of Historic Places. The significant cultural sites currently identified are the Bridger Antelope Trap, Emigrant Spring/Slate Creek, Emigrant Spring/Dempsey, Johnston Scout Rock, Alfred Corum and Nancy Hill Graves, Pine Grove Emigrant Camp, Rocky Gap Trail Interpretive Site, Bear River Divide Trail Interpretive Site, and Gateway Petroglyphs viewshed. As other sites meeting these criteria or values are identified, BLM may elect to include them as significant cultural sites.

Special Recreation Management Areas (SRMAs): These are areas where congressionally recognized recreation values exist or where significant public recreation issues or management concerns occur. Special or more intensive types of management typically are needed.

Special Status Species: Special status species are species proposed for listing, officially listed as threatened or endangered, or are candidates for listing as threatened or endangered under the provisions of the Endangered Species Act; those listed by a state in a category, such as threatened or endangered, implying potential endangerment or extinction; and those designated by the State Director as sensitive (BLM 2001).

Split-Estate: Surface land and mineral estate of a given area under different ownerships. Frequently, the surface will be privately owned and the minerals federally owned.

Standard Practices: These practices are applied to surface-disturbing activities and are statements of guidelines and techniques for establishing statewide (or national) consistency in avoiding and mitigating environmental impacts and resource conflicts. These practices have been developed through field experience, planning analyses, and legal or regulatory directives. They emphasize the responsibility of the Bureau of Land Management (BLM) to ensure that good construction practices are used on public lands, and that they apply to all surface-disturbing activities (BLM 2007a).

State-Listed Species: Species proposed for listing or listed by a state in a category implying, but not limited to, potential endangerment or extinction. Listing is either by legislation or regulation.

Surface-disturbing Activities (or Surface Disturbance): Surface disturbance is the physical disturbance and movement or removal of land surface and vegetation. These activities range from the very minimal to the maximum types of surface disturbance associated with such things as off-road vehicle travel or use of mechanized, rubber-tired, or tracked equipment and vehicles; some timber cutting and forest silvicultural practices; excavation and development activities associated with the use of heavy equipment for road, pipeline, powerlines and other types of construction; blasting; strip, pit, and underground mining and related activities, including ancillary facility construction; oil and gas well drilling and field construction or development and related activities; range improvement project construction; and recreation site construction. *The Wyoming State Office currently is revising this definition.*

Surface Water Classes and Uses: The following water classes are a hierarchical categorization of waters according to existing and designated uses. Except for Class 1 waters, each classification is protected for its specified uses plus all the uses contained in each lower classification. Class 1 designations are based on value determinations rather than use support and are protected for all uses in existence at the time of or after designation. There are four major classes of surface water in Wyoming with various subcategories within each class (see "Wyoming Surface Water Classification List" for current listing).

(a) Class 1, Outstanding Waters. Class 1 waters are those surface waters in which no further water quality degradation by point source discharges other than from dams will be allowed. Nonpoint sources of pollution shall be controlled through implementing appropriate best management practices. Pursuant to Section 7 of these regulations, the water quality and physical and biological integrity that existed on the water at the time of designation will be maintained and protected. In designating Class 1 waters, the Environmental Quality Council shall consider water quality, aesthetic, scenic, recreational, ecological, agricultural, botanical, zoological, municipal, industrial, historical, geological, cultural, archeological, fish and wildlife, the presence of substantial quantities of developable water, and other values of present and future benefit to the people.

(b) Class 2, Fisheries and Drinking Water. Class 2 waters are waters, other than those designated as Class 1, that are known to support fish or drinking water supplies or where those uses are attainable. Class 2 waters may be perennial, intermittent, or ephemeral. Five subcategories of Class 2 waters exist.

(c) Class 3, Aquatic Life Other than Fish. Class 3 waters are waters other than those designated as Class 1 that are intermittent, ephemeral, or isolated waters, and because of natural habitat conditions, do not support nor have the potential to support fish populations or spawning or certain perennial waters that lack the natural water quality to support fish (e.g., geothermal areas). Class 3 waters provide support for invertebrates, amphibians, or other flora and fauna that inhabit waters of the state at some stage of their life-cycles. Uses designated on Class 3 waters include aquatic life other than fish, recreation, wildlife, industry, agriculture, and scenic value. Generally, waters suitable for this classification have wetland characteristics; such characteristics will be a primary indicator used in identifying Class 3 waters. There are four subcategories of Class 3 waters.

(d) Class 4, Agriculture, Industry, Recreation, and Wildlife. Class 4 waters are waters other than those designated as Class 1 where it has been determined that aquatic life uses are not attainable pursuant to the provisions of Section 33 of these regulations. Uses designated on Class 4 waters include recreation, wildlife, industry, agriculture, and scenic value (Wyoming DEQ 2002).

Traditional Cultural Property (TCP): A cultural property that is eligible for inclusion in the National Register of Historic Places because of its association with a living community's cultural practices or beliefs that (a) are rooted in that community's history; and (b) are important in maintaining the community's continuing cultural identity (BLM 2007b).

Trails: The term "trails," when used in the phrase "roads and trails" in association with off-highway vehicle designations, means motor vehicle trails only. These include distinct two-track vehicle trails or single-track motorcycle trails created by the passage of motor vehicles and which receive continuous use. Cow paths, foot trails, mountain bike trails, and game trails are not motor vehicle trails and motor vehicle travel is not allowed on them. Vehicle traces created by the unauthorized passage of a few motor vehicles are not legal motor vehicle trails.

Vegetative Diversity: The variety of vegetative types in an area, including species, the genetic differences among species and populations, the communities and ecosystems in which vegetation types occur, and the structure and seral stage of these communities. Vegetative diversity includes rare as well as common vegetative types, and typically supports a diverse array of animal species and communities.

Viewshed: A viewshed is used in Visual Resource Management to describe "…landscape that can be seen under favorable atmospheric conditions from a viewpoint (key observation point) or along a transportation corridor" (BLM 1984).

Visual Resources: The visible physical features of a landscape (topography, water, vegetation, animals, structures, and other features) that constitute the scenery of an area.

Visual Resource Management (VRM) Classes:

> **Class I.** The objective of this class is to maintain a landscape setting that appears unaltered by humans. It is applied to wilderness areas, some natural areas, wild portions of wild and scenic rivers, and other similar situations in which management activities are to be restricted.
>
> **Class II.** The objective of this class is to design proposed alterations so as to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
>
> **Class III.** The objective of this class is to design proposed alterations so as to partially retain the existing character of the landscape. Contrasts to the basic elements (form, line, color, and texture) caused by a management activity may be evident and begin to attract attention in the characteristic landscape; however, the changes should remain subordinate to the existing characteristic landscape.
>
> **Class IV.** The objective of this class is to provide for management activities that require major modification of the existing character of the landscape. Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, changes should repeat the basic elements (form, line, color, and texture) inherent in the characteristic landscape.
>
> **Rehabilitation Area.** Change is needed or change may add acceptable visual variety to an area. This class applies to areas where the naturalistic character has been disturbed to a point at which rehabilitation is needed to bring it back into character with the surrounding landscape. This class would apply to areas identified in the scenic evaluation where the quality class has been reduced because of unacceptable cultural modification. The contrast is inharmonious with the characteristic landscape. It also may be applied to areas having the potential for enhancement; i.e., add acceptable visual variety to an area or site. It should be considered an interim or short-term classification until one of the other VRM class objectives can be reached through rehabilitation or enhancement. The desired VRM class should be identified.

Wildfire: Any natural fire ignition occurring on wildland that neither meets management objectives nor occurs within a prescribed fire area, thus requiring a suppression response.

Wildlife-disturbing Activity: Authorized activities that may cause displacement of or excessive stress to wildlife during critical life stages or during periods of severe weather conditions. Wildlife-disturbing activities include human presence, noise, and activities using motorized vehicles or equipment.

Withdrawal: Removal or withholding of public lands, by statute or Secretarial order, from operation of some or all of the public land laws. A mineral withdrawal includes public lands potentially valuable for leasable minerals, precluding the disposal of the lands, except with a mineral reservation clause, unless the lands are found not to contain a valuable deposit of minerals. A mineral withdrawal is the closing of an area to mineral location and development activities.

Yellowcake: Yellowcake is the product of the uranium extraction (milling) process. Early production methods resulted in a bright yellow compound, hence the name yellowcake. The material is a mixture of uranium oxides that can vary in proportion and color from yellow to orange to dark green (blackish), depending at which temperature the material was dried (level of hydration and impurities). Higher drying temperatures produce a darker, less soluble material. Yellowcake is commonly referred to as U3O8 and is assayed as pounds U3O8 equivalent. This fine powder is packaged in drums and sent to a conversion plant that produces uranium hexafluoride as the next step in the manufacturing of nuclear fuel.

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